

**EVALUATION STUDY OF  
THE NEW JERSEY TURNPIKE AUTHORITY'S  
VALUE PRICING INITIATIVE**

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## EXECUTIVE SUMMARY

The project's main focus is to analyze users' behavioral changes as a consequence of the implementation of value pricing by the New Jersey Turnpike Authority (NJTA). The items to be monitored, studied, evaluated, and, where appropriate, compared before and after implementation of pricing scheme as well with and without pricing are shown in Table 1.

This document provides an overall description of the monitoring and evaluation process that the research team from The City University of New York (CUNY) and Rutgers University expects to implement. The project will be a multi-year joint collaboration between the CUNY's Institute for Urban Systems (CIUS), the Center for Advance Infrastructure and Transportation at Rutgers University (CAIT/RU), the Alan M. Voorhees Transportation Center at Rutgers University (VTC/RU), and the New York University's Rudin Center for Transportation Policy and Management (NYU/RC). Since the changes on user behavior will take place over a relatively long period of time, the entire monitoring and evaluation process is expected to last four years. However, this proposal and the corresponding budget refer to the first year of work.

### Table 1: Items to be studied

#### **Focus Area I: Descriptive Analysis**

##### ***A. Operational elements at New Jersey Turnpike Facilities***

Describe:

- ◆ New Jersey Turnpike: access, geographic areas, speeds, toll collection scheme
- ◆ Traffic ordinance violations and enforcement
- ◆ Strategy followed by New Jersey Turnpike Authority in implementing EZ-PASS and Value Pricing

Collect data on:

- ◆ Traffic volumes by vehicle type and time of day
- ◆ Traffic composition by time of day
- ◆ Traffic counts by toll plaza by time of day
- ◆ Accidents and incidents

##### ***B. Current toll structures and role of electronic toll collection***

Describe:

- ◆ Implementation strategy: passenger cars, trucks

Assess:

- ◆ Acceptance rates and level of penetration of EZ-PASS
- ◆ Acceptance of Value Pricing

***C. Socio-economic profiles of users***

Collect data on:

- ◆ Income, gender, ethnicity, travel profile and overall characteristics of users and non users

Estimate through modeling:

- ◆ Travel time values
- ◆ Direct and cross elasticities
- ◆ Income elasticities

***D. Inter-Agency Coordination***

- ◆ Ensure cooperation and efficient coordination among stakeholders

***E. Media and Decision-Makers' Reaction***

- ◆ Monitor media and decision-makers reaction to the various stages of implementation of value pricing

**Focus Area II: Behavioral Analyses**

***A. Travel Behavior: Passenger Transportation***

Collect data and investigate through modeling the characteristics of (long term):

- ◆ Vehicle utilization and auto ownership
- ◆ Route choice
- ◆ Departure time
- ◆ Joint processes of route choice and departure time
- ◆ Traffic diversion
- ◆ Mode choice
- ◆ Vehicle occupancies
- ◆ Assessment of trip curtailment and before/after trip generation
- ◆ Joint processes of trip generation and trip chaining
- ◆ User responses to dynamic traffic information and pricing
- ◆ The role of the trip length upon the choice processes described above

***B. Commercial Vehicles (if and when implemented)***

Collect data and investigate through modeling the characteristics of (long term):

- ◆ Vehicle utilization
- ◆ Route choice
- ◆ Departure time
- ◆ Joint processes of route choice and departure time
- ◆ Shipment size selection
- ◆ Joint processes of shipment size and vehicle selection choice
- ◆ User responses to dynamic traffic information and pricing

**Focus Area III: System Wide Impacts (NJ Turnpike and competing facilities)**

**Traffic Congestion Impacts**

Collect data and assess through modeling:

- ◆ Economic value of travel time savings
- ◆ Differential impacts upon user classes

Environmental Impacts (minor emphasis)

Collect data and assess through modeling:

- ◆ Air quality (e.g., PM<sub>2.5</sub>, NOX, Elemental Carbon)
- ◆ Other environmental impacts
- ◆ Fuel consumption
- ◆ Community impacts (e.g., noise, air pollution, safety)

Other Economic Impacts (minor emphasis)

Collect data and assess through modeling:

- ◆ Retail sales; sales tax revenue
- ◆ Employment by industry
- ◆ Other business impacts

***Budget***

The resources estimated for successful completion of this project are shown in Appendices I and II. The budgets are based on different assumptions. Budget I assumes that this project would cover all costs associated to monitoring the implementation of value pricing at the New Jersey Turnpike. This would include staff costs and the full cost of the \$140,000 for the first wave of the panel data. Budget II assumes that some of the staff and data collection costs are shared by the monitoring study of the value pricing project at the Port Authority of New York and New Jersey (PANYNJ).

FHWA regulations requires a 20% matching. The matching funds are provided by City College of New York (release time), Rutgers University (release time), New Jersey DOT (traffic data), and the New Jersey Turnpike Authority (traffic data). The budget includes matching funds from New Jersey DOT to pay for traffic data collection on the parallel routes to the New Jersey Turnpike. The summary of budget figures for the first year is shown in Table 2.

**Table 2: Summary of budget figures**

Budget	Total	FHWA	Total Local match	NJDOT matching	Universities matching
I (All costs)	\$747,307	\$597,466	\$149,842	\$68,000	\$81,842
II (Shared costs)	\$597,209	\$477,468	\$119,741	\$53,000	\$66,741

# TECHNICAL PROPOSAL

## *Purpose of proposed study*

This document provides an overall description of the monitoring and evaluation process that the research team from The City University of New York (CUNY) and Rutgers University expects to implement. The project will be a multi-year joint collaboration between the CUNY's Institute for Urban Systems (CIUS), the Department of Civil and Environmental Engineering at Rutgers University (DCEE/RU), the Alan M. Voorhees Transportation Center at Rutgers University (VTC/RU), and the New York University's Rudin Center for Transportation Policy and Management (NYU/RC). This project will be conducted in close collaboration with the New Jersey Department of Transportation (NJDOT) and the New Jersey Turnpike Authority (NJTA). Both agencies have already pledged full cooperation with the research team.

The proposed plan describes the components of data collection and analysis, as well as the supporting activities. This document describes the activities to be carried out, the methods to be applied, the data sources to be utilized, as well as the corresponding deliverables. Other sections of the document describe the organizational structure of the research team, the assignments of lead responsibility and the anticipated timeline.

The project's main focus is to monitor the impacts of the New Jersey Turnpike Authority's Value Pricing initiative, both at the system wide level and at the user level. The research team is interested, among other things, in assessing the behavioral changes as a consequence of the implementation of value pricing. In order to maximize the cost-effectiveness of the resources available to this investigation, the project team decided to study: (a) the impact of value pricing on the traffic of the entire New Jersey Turnpike; and (b) the behavioral impacts of value pricing on the users of the Northern part of the New Jersey Turnpike. This enables the project team to cover the entire length of the project and, at the same time, conduct advanced behavioral modeling on the most congested section of the NJTPk. The proposal has three main focus areas: *Descriptive Analyses*, *Behavioral Analyses* and *System Wide Impacts*. In each of these focus areas, different items will be analyzed and investigated. The items to be monitored, studied, evaluated, and, where appropriate, compared before and after implementation of the value pricing scheme are shown in Table 1.

**Table 1: Items to be studied**

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***A. Operational elements at New Jersey Turnpike Facilities***

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Collect data on:

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***B. Current toll structures and role of electronic toll collection***

Describe:

Implementation strategy: passenger cars, trucks

Assess:

- ◆ Acceptance rates and level of penetration of EZ-PASS
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***C. Socio-economic profiles of users***

Collect data on:

- ◆ Income, gender, ethnicity, travel profile and overall characteristics of users and non users

Estimate through modeling:

- ◆ Travel time values
- ◆ Direct and cross elasticities
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***F. Inter-Agency Coordination***

- ◆ Ensure cooperation and efficient coordination among stakeholders

***G. Media and Decision-Makers' Reaction***

- ◆ Monitor media and decision-makers reaction to the various stages of implementation of value pricing

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**Focus Area III: System Wide Impacts (NJ Turnpike and competing facilities)**

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Collect data and assess through modeling:

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Environmental Impacts (minor emphasis)

Collect data and assess through modeling:

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- ◆ Other environmental impacts
- ◆ Fuel consumption
- ◆ Community impacts (e.g., noise, air pollution, safety)

Other Economic Impacts (minor emphasis)

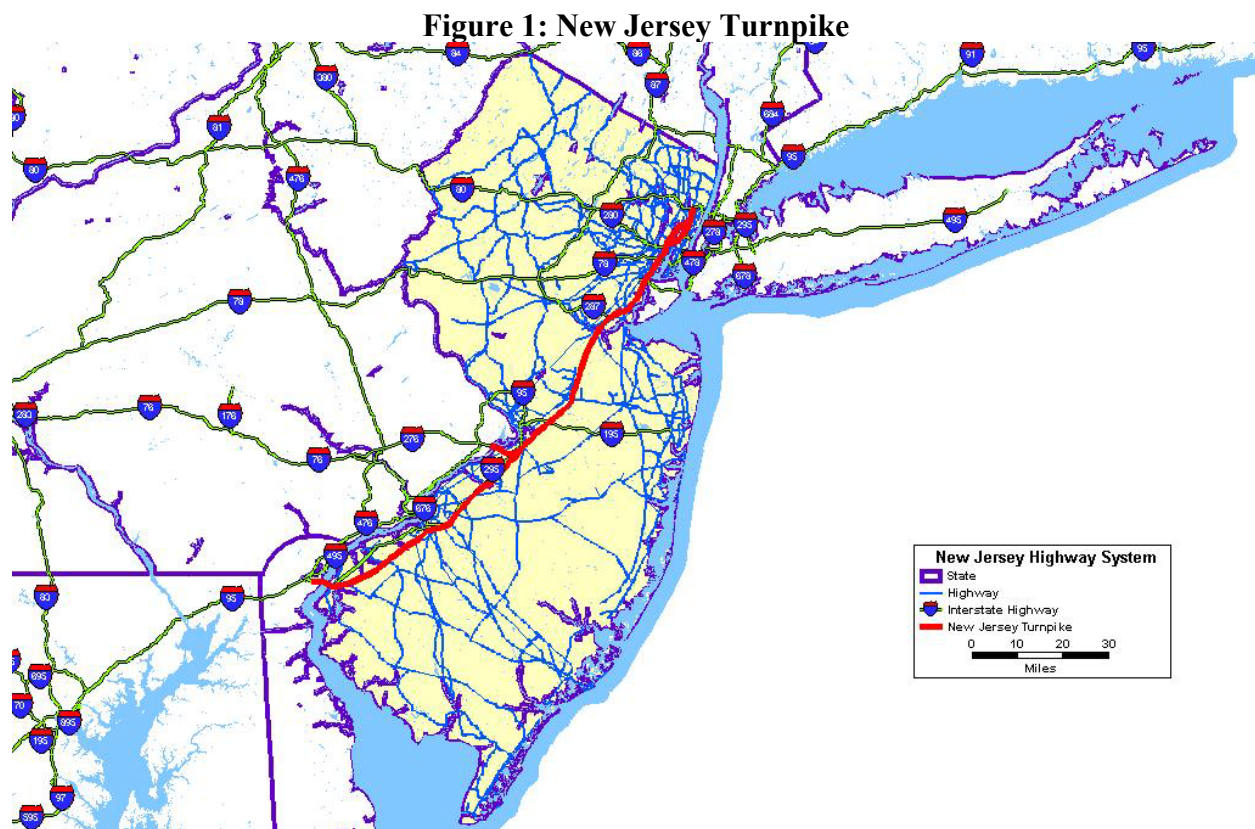
Collect data and assess through modeling:

- ◆ Retail sales; sales tax revenue
- ◆ Employment by industry
- ◆ Other business impacts

This proposal is organized in the following manner. The first section, *The New Jersey Turnpike (NJTPk)*, provides the reader with an idea about the scope and complexity of the NJTPk. The section entitled *Methodological Framework* focuses on describing the methodology the research team expects to implement. The section *Organizational Structure of the Research Team* contains a brief description of the assignment of lead responsibilities and organization of the team members. *Schedule of Activities* presents the timeline for the different tasks included in this proposal. The estimates of resources required to complete this investigation are presented in the *Budget* section.

### ***Description of the New Jersey Turnpike***

The New Jersey Turnpike (NJTPk) is a 148 mile-toll road that extends from the Delaware Memorial Bridge in the South of New Jersey to George Washington Bridge in New York City. The road was constructed between December 1949 and January 1951 after legislation was enacted establishing the New Jersey Turnpike Authority, NJTA (NJTA, 1998). The Authority's mandate included the construction and implementation of a 'pay-as-you-use' facility, and the management of the facility to enhance traffic flow and quality of service for users. The Turnpike was constructed on the State Highway 100 corridor at a cost of \$278 million. A schematic of the Turnpike and the surrounding transportation network is shown in Figure 1.



Since its completion in 1952, the Turnpike has played a key role in facilitating the economic development of the State of New Jersey, its neighboring municipalities, and the entire mid-Atlantic region. Trips between Boston, New York, Philadelphia and Washington D.C. for work, vacations, shopping, recreation, or delivery of goods and services almost always include a trip on the Turnpike. According to NJTA's 1998 report, approximately 35% of the total trips on the Turnpike do not originate in New Jersey (NJTA, 2001a).

Currently, the road has 28 interchanges, commonly referred to as exits, with two more planned in the next decade. Because of increased demand, the number of exits was increased to 21 in 1956 and to 24 in 1970 (Strauss, 2000). The Turnpike was one of the most densely used roadways in the country with an average daily traffic that exceeds 500,000 vehicles. The interchanges connect to New Jersey's major highways and vast transportation network, institutions, and economic hubs. The NJTPk also has 12 service centers, six are accessible to southbound traffic, five to northbound traffic, and one is accessible to both directions (NJTA, 2001b). The centers, operated under contract by Marriott, sell gasoline, consumables and gifts. In 1992, the service centers dispensed approximately 50,000,000 gallons of gasoline, a factor that helps keep the tolls at minimum.

### **Tolls and revenue from the Turnpike**

The toll-road concept was developed by Governor Alfred Driscoll to connect the shipping and industrial hubs of Camden and Trenton to Elizabeth and Newark (Strauss, 2000). To minimize queueing delays, the Turnpike was to have a minimal number of toll plazas over its 148 miles and the toll plazas were located at the exits off the Turnpike. Since its inception, the Turnpike has employed price differentiation based on:

- Use of the facility: the longer the distance traveled the higher the toll
- Vehicle Classification: the amount of the toll is based on number of axles, vehicle type, and tare weight. The Authority has defined the 8 vehicle classes: 2 for buses and 5 for trucks and 1 for passenger-cars (NJTA, 2001c).

Although generally the longer the trip the higher the toll, the tolls are not a function of distance only, but incorporate some measure of attractiveness of the different zones/cities. U-turns on the toll road attract penalties amounting to the maximum toll. On the whole the toll is not based on dynamic traffic demand characteristics like congestion. Originally, the tolls were intended to raise funds for operational and maintenance activities, which has been achieved with the increase in demand from 765 million passenger-miles in 1952 to 5 billion passenger miles in 1998 (NJTA, 1998).

- No State tax money is used to fund the NJTPk. In 1997, NJTPk contributed \$12 million to the State Transportation Trust Fund.

- 92% of the Turnpike's revenue is derived from tolls. In 1998 the Authority collected over \$360 million from the 209 million vehicles that traveled on the Turnpike compared to \$0.62 million from 781,195 vehicles in 1952.
- The Authority funds a contingent of 214 State Police who patrol the highway.

The benefits realized on the Turnpike include (NJTA, 2001a):

- Reduced fatality rates to users. In 1997 there were 24 fatalities on the Turnpike compared to 48 in 1952 in spite of the increase in traffic.
- Having access to a facility at virtually no cost to the tax payers.

The current toll schedule depends, as stated before, upon the distance traveled, whether or not EZ-PASS is used, and the time of the day (not for commercial vehicles). The current and the old tolls are shown in Table 2 for passenger cars and semi-trailers (the complete toll schedule can be found at <http://www.state.nj.us/turnpike/tr2000.htm>).

**Table 2: Tolls for passenger cars and semi-trailers**

Type of vehicle:	From 1 to 18W	From 13 to 18W
<b>Passenger Cars</b>		
Cash	\$5.50	\$1.90
EZ-Pass Off-Peak	\$4.60	\$1.60
EZ-Pass Peak	\$4.95	\$1.75
EZ-Pass Weekend	\$4.95	\$1.75
Old tolls (before September 2000)	\$4.60	\$1.60
<b>Semi-Trailers</b>		
Cash	\$23.50	\$8.95
EZ-Pass	\$22.45	\$8.55
Old tolls (before September 2000)	\$20.80	\$7.90

### ***Methodological framework***

As indicated before, this proposal has three main focus areas. The first one, *Descriptive Analyses*, focuses on the analyses of the aggregate changes taking place as a consequence of value pricing (e.g., changes in traffic composition and hourly distribution, changes in the socio-economic profile of the users). The second focus area, *Behavioral Analyses*, is intended to structure an analytical framework to monitor long-term behavioral changes of the users resulting from the value pricing implementation on the New Jersey Turnpike (NJTPk). The objective of the third focus area, *System Wide Impacts*, is to gain insights into the broader impacts of the

implementation of Value Pricing on the NJTPk. This will provide an objective assessment of the experience gained at the NJTPk that will undoubtedly benefit future implementations.

Oversight and guidance to this investigation will be provided by two different advisory groups. The Policy Advisory Group (PAG) will provide guidance and support related to the key policy issues associated with this investigation. The PAG will be comprised of Mr. Edward Gross, Executive Director of the NJTA; Mr. William Hoffman, Director of Research of the New Jersey Department of Transportation; Mr. Matthew Edelman, Executive Director of TRANSCOM; Mr. Jeff Zupan, Regional Plan Association; and Mr. Patrick De Corla-Souza, Federal Highway Administration. It is anticipated that the PAG will meet twice a year, once at the beginning of the project and another to discuss preliminary findings before producing the final report.

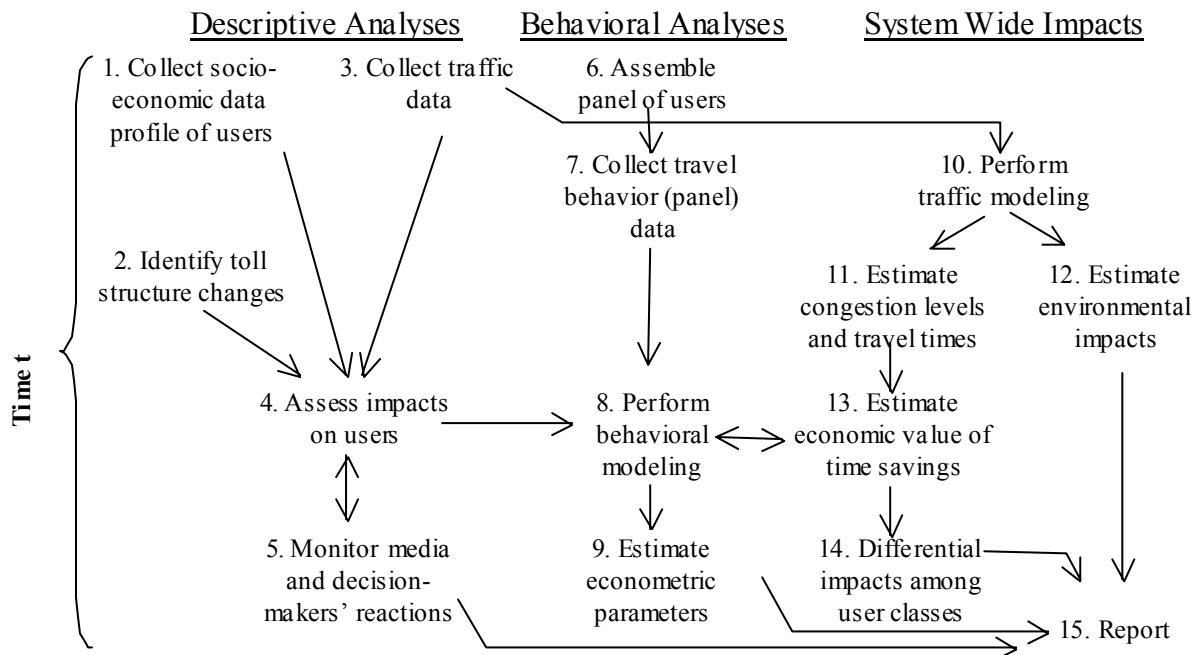
The Technical Advisory Group (TAG) will provide guidance and support in technical matters. The TAG will be comprised of technical staff of the New Jersey Department of Transportation, the North Jersey Transportation Planning Authority (NJTPA), the New York Metropolitan Transportation Council (NYMTC), the local representative of the Federal Highway Administration, representatives of K.T. Analytics, consultants to FHWA, as well as representatives from FHWA headquarters. It is anticipated that the TAG will meet, at least three times a year. The first meeting will be a working meeting in which the research team will present a preliminary draft of the methodology to be implemented during the project. This methodology will be reviewed and discussed with the TAG. The second and third meetings will be to discuss interim results and provide guidance to this investigation, as needed.

Figure 2 shows a depiction of the methodology the research team expects to implement at a time period  $t$ . Some of the components shown are going to be performed as part of subsequent time periods  $t+1$ ,  $t+2$  and so forth. In a rather preliminary way, the research team has identified three main update frequencies: (a) Continuous, which refers to data collection processes that takes place all the time (e.g., traffic counts at toll booths); (b) Quarterly updates; and (c) Before and After the implementation of toll structure changes.

The focus areas and the different tasks are described next. The task numbers correspond to the task numbers in Figure 2. The dollar figures are the approximate amount of resources

required for successful completion of each task, assuming that common costs are going to be shared with the monitoring study of the Port Authority of New York and New Jersey (Budget II).

**Figure 2: Methodology proposed**



### ***Focus Area I: Descriptive analyses (\$177,000)***

As part of the descriptive analyses, data will be collected on the socio-economic profiles of users and on the operational aspects of the New Jersey Turnpike facilities. The socio-economic data will include, among other characteristics, user income, gender, ethnicity, and travel profiles. The operational data will include traffic volumes by vehicle type and time of day, traffic composition by time of day, traffic counts by toll plaza by time of day, accidents and incidents. These data will be collected at different time periods, and with different update frequencies to be able to capture both transient and steady state patterns in user behavior. The activities comprising the Descriptive Analyses component of this project are described next.

*Preliminary Task: Refining scope of work of the investigation.* Once the Technical Advisory Group (TAG) has been formed, the project team will proceed to refine the scope of work of the project. This important task is intended to take advantage of the collective expertise of the researchers that have already conducted similar studies for FHWA. The scope of work will then be submitted to Federal Highway Administration for review and approval.

*Task 1 (\$12,000): Collect socio-economic characteristics of the users.* The characterization of the socio-economic profile of the NJTPk users is an important component of this investigation because, among other things, it enables the examination of the differential impacts upon the different user classes. The first step in this task is to identify the data sets already collected by both the NJTA and NJDOT as part of their respective data collection programs. Since NJTA and NJDOT have already pledged full cooperation, the research team does not expect any problems in having access to their data sets. These data sets will be analyzed by the research team to determine their suitability for the purposes of this investigation. On the basis of the existing data sets and the NJTA-NJDOT data collection plan, the research team will define this investigation's data collection plan, aimed at gathering the socio-economic characteristics needed for this investigation.

The data collection process will require statistical sampling from the population of users, i.e., the statistical universe. The sampling universe will be defined on the basis of the catchment areas identified by NJTA staff, as part of their regular data collection program. These definitions will be further refined by an analysis of the geographic distribution of EZ-PASS holders (the regional electronic toll collection system).

Once the sampling universe has been identified, Computer Aided Telephone Interviews (CATI) will be undertaken of a random sample of users. A questionnaire, containing the questions designed to gather the socio-economic variables and travel behavior information to be quantified, will be prepared and pilot tested, before the CATI. The survey instrument will be redesigned on the basis of the experience gained during the pilot test. From the before and after data, the impacts of value pricing on users will be assessed. The acceptance rates and level of penetration of EZ-PASS and value pricing will be assessed. In addition, travel time values, direct and cross elasticities, and income elasticities will be estimated. The overall process to be followed during the data collection of socio-economic characteristics is outlined below:

- Gather available datasets (both from NJTA and NJDOT)
- Identify the main characteristics of the available data sets
- Design the study's socio-economic data collection plan defining the variables to be included, the level of detail, and the corresponding sampling rates

- Design survey instruments
- Define statistical universe drawing from NJTA experience and NJTA's previous data collection efforts
- Pilot test and revise survey instrument
- Draw sample and conduct CATI
- Analyze results

*Task 2 (\$5,000): Identification of toll structure changes.* The research team, in collaboration with the NJTA, will identify the schedule of implementation of toll structure changes. This schedule will be used to define the data collection milestones and to plan the main activities of this project.

*Task 3 (\$114,000): Traffic data collection.* NJTA has a comprehensive traffic monitoring system that continuously collects traffic data at toll booths and entrance/exit ramps. This data set will be complemented with traffic data collected at: (a) competing facilities; and (b) facilities selected for control purposes. The data collected are comprised of classified traffic counts by time of day and facility. The research team will gather the traffic data from NJTA and NJDOT to establish the baseline of traffic conditions and to analyze the overall traffic patterns and its response to value pricing. The traffic data will be used to assess the impact of value pricing upon the hourly and daily distribution of traffic by type of vehicle. The traffic data gathered here will be a critical input to the traffic models to be developed as part of this investigation.

The analysis will also consider the impact of value pricing upon the origin-destination of trips in the area. TRANSCOM has installed a network of transponder readers that are able to estimate the entry/exit patterns in the area. This information is important for dynamic estimation of origin-destination matrices and their relationship to the pricing structure.

At the end of this task, a report summarizing the key findings and conclusions regarding the impacts the price changes has had on traffic volumes and throughput will be put together. This report will also analyze and compare traffic volumes and throughput for the following conditions: pre-EZPASS, EZPASS without Value Pricing and EZPASS with Value Pricing.

*Task 4 (\$26,000): Assess impacts on users.* On the basis of the socio-economic profiles and the traffic data collected, the research team will conduct a descriptive analysis of the impact of value pricing. The analysis of the impacts of value pricing upon traffic will be done for the entire length of the NJTPk. This analysis will focus on the aggregate behavior of the population of users. A short report, summarizing the key findings, will be written at the end of this analysis phase. The analysis will focus on assessing the changes on:

- traffic composition during peak and off-peak hours
- car occupancy
- transit ridership
- the socio-economic profile of the users for the before and after conditions (this would help identify changes in the different user groups using the facility).

*Task 5 (\$21,000): Monitor media and decision-makers' reaction to value pricing and changes in the toll schedule.* This important task will gauge the acceptability of value pricing to public opinion and decision-makers after implementation of the toll schedule changes. The continuation of, and future applicability of value pricing to other toll facilities in the metropolitan region will depend in large measure on the perception of its impact, either positive or negative, by elected officials, editorial writers and key constituency groups that influence decision-makers that govern toll policy. In summary, this task will provide a barometer as to whether value pricing can be easily replicated in other areas and will identify what, if any, barriers exist.

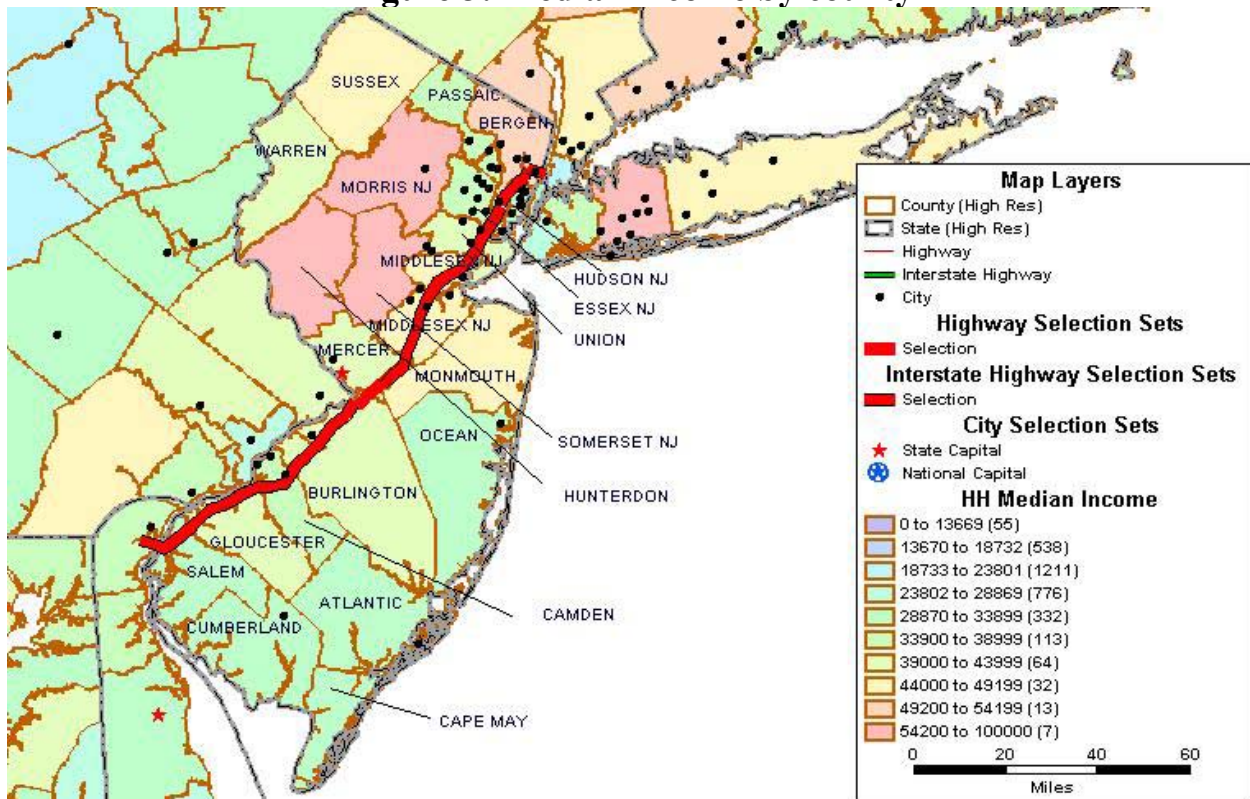
The team will approach this task by first identifying the full complement of decision-makers, impacted state and local elected officials, interested organizations and influential media outlets. Historic data will be collected and summarized, including relevant newspaper clippings and press statements that document media reporting on stakeholder and decision-maker reaction, as well as editorial writings. Each of the key stakeholders will also be surveyed twice over the course of the study to assess changes in perceptions regarding the success or failure of time-of-day pricing. The first survey will determine initial reactions, expectations of success or failure, and will identify measures that are perceived to constitute success. A follow-up survey will be undertaken toward the end of the first year to assess whether opinions have changed. A report, containing the key findings, will be written at the end of the task.

## ***Focus Area II: Behavioral analyses (\$200,000)***

The conditions before, during and after the various stages of implementation of value pricing will be quantified and data will be collected in order to track changes in behavior over time. Among other things this will enable to sort out the influence of Value Pricing from the influence of other variables and, at the same time, will help create a long-term database for behavioral research on this subject.

An unique feature of this project is the length of the priced facility. The NJTPk is 148 miles which contrasts to the approximately 10 miles of both SR91 and I-15. This is, at the same time, a challenge and an opportunity. It is an opportunity because it provides a unique real life case study to analyze the role of trip length on the behavioral processes taking place in reaction to value pricing. Contrary to the case of shorter facilities, in which a switch from the peak hour to the off-peak is usually accommodated through a change in departure time, users of the NJTPk could achieve similar results by simply changing their travel speeds. The role of the trip length is further complicated by the fact that different sections of the NJTPK, because of its length, have peak hours at different times of the day. The length of the NJTPk is a challenge because of the implications in terms of data collection. As it would be expected in a facility that runs across the northern portion of the State of New Jersey, there are significant differences among the socio-economic characteristics and the travel patterns of the population living around the NJTPk. As shown in Figure 2, the median income for the counties served by the NJTPk ranges from \$34,518 (i.e., Essex) to counties with median income higher than \$54,200 (e.g., Somerset). Furthermore, the urban patterns in these counties vary greatly. The counties in the vicinity of New York have are established settlements economically linked to the urban centers of Newark and New York City; while the counties in the Southern portion of the NJTPk have a significant amount of rural activities and low density settlements. The variability in their socio-economic characteristics, and the associated travel patterns, significantly increase the corresponding data collection costs.

**Figure 3: Median income by county**



As may be expected, the costs associated with collecting statistically representative behavioral data at such scale are significant. For that reason, the project team decided, in order to maximize the cost-effectiveness of this investigation, to focus the behavioral analyses on the local users (e.g., residents of New Jersey) of the Northern section of the NJTPk. This enables the project team to focus on the most congested section of the NJTPk to gain insights into the behavioral process resulting from value pricing.

As part of the behavioral analyses, long term data on travel behavior will be collected from panel surveys. The research team leans toward the use of panel surveys, instead of alternative approaches such as Repeated Cross Sections (RCS), because:

1. The behavioral responses to value pricing are likely to be conditioned by the past experiences as users of the NJTPk (panels are known to adequately capture this phenomenon, technically referred to as inter-temporal state-dependence).
2. In cases where inter-temporal state-dependence is present, panels are more efficient than alternative approaches such as RCS.

3. Establishing cause-effect relationships is easier because the panel is able to track the over-time changes for a given individual.

The research team is also aware of the typical problems with panels: (a) attrition bias, (b) panel stagnation; (c) panel conditioning; and (d) panel fatigue. In order to address these effects, the research team will consider the use of panel refreshment strategies and/or hybrid panel designs (e.g., Rotating Panel Surveys, Split Panel Surveys). Important preliminary tasks will be: (a) a methodological review of the experience gained during the investigation at the impact of value pricing at the I-15 project that, among other things, would enable the research team to build upon the experience gained during that project; and (b) a close examination of the implementation schedule of toll changes to ensure that the timing and the overall data collection plan is appropriate.

An interesting methodological alternative is to use Split Panel Surveys (SPS), in which a panel and a non-overlapping cross sectional sample are assembled. Data from the control groups outside of the region will allow the changes in behavior due to value pricing to be sorted out from the changes which would have occurred anyway. Target areas will be identified which represent those neighborhoods where resident-trip makers are most likely to be affected by the NJTPk pricing changes. Using sampling techniques, a panel of individuals from the target area will be assembled. A control panel from another part of New Jersey will be used for comparison purposes. Data collected will include vehicle utilization and car ownership, route choice, departure time, mode choice, vehicle occupancies, user perceptions about EZ-PASS and Value Pricing, and user responses to dynamic traffic information and pricing.

*Tasks 6-7 (\$180,000): Assemble panel of users. Collect travel behavior data.* A panel of households will be established to aid in the evaluation of the value pricing strategies. The samples will be choice-based with the 1990 survey used to establish appropriate weights that will be updated as soon as the 2000 Census becomes available. The sample size will be selected on the basis of sampling design concepts and a number of different user classes will be identified and sampled accordingly so that statistically significant results for key user groups are obtained in both the initial and subsequent waves. It is important to recognize that sample refreshment may be necessary if sample attrition is high either overall or in specific subgroups, and/or to reduce the risk of sample stagnation and to ensure the sample is representative of the population.

Concurrently, a subset of the sample will be drawn from the population outside the area of influence of the NJTPk. This subset will play the role of control sample and it will provide invaluable information for comparison purposes.

The questionnaire will be designed to gather data about socio-economic, locational, and travel characteristics in a multi-day activity trip dairy format. The research team will rely on the experience of its team members and outside consultants to design the questionnaires and the overall process by which the panel will be assembled.

Although the details of the sampling program still need to be worked out, it is likely that the initial wave will gather the most comprehensive data set, which is required to put together the socio-economic characteristics of the sample. This activity will benefit directly from the data collection process conducted as part of the descriptive analyses of socio-economic characteristics discussed in the previous section. The research team will also consider consolidating the data collection process of Focus Area I with that of the Focus Area II: Behavioral Analyses.

In summary, the process discussed above will consist of:

- Defining the statistical universe on the basis of the 1990 Census
- Defining a choice-based sample with sampling weights from 1990 Census
- Assembling a panel of users
- Assembling a control panel
- Designing questionnaires in a multi-day activity diary format
- Conducting the data collection in different waves

If and when value pricing is implemented for commercial vehicles, commercial users will be surveyed as well. For freight users, target areas will be identified which represent those zones and commercial areas most likely to be affected by the changes in pricing on the Turnpike. The panel will consist of business and trucking company representatives from the target areas. A control panel from outside the target area will be used for comparison purposes. Data collected from the freight panel will include vehicle utilization, delivery route choice, departure time, shipment size, frequency, and user responses to dynamic traffic information and pricing.

*Tasks 8-9 (\$20,000): Behavioral modeling. Estimation of econometric parameters.* The research team will use discrete choice models to assess relevant econometric parameters for the different user classes. The behavioral modeling to be undertaken will take advantage of state of the art techniques of discrete choice modeling. The research team will take advantage of the strengths of discrete choice models in representing decision makers' decision processes. To this effect, the various choice problems under study are going to be analyzed conceptually to determine their fundamental characteristics and to determine which type of models are most appropriate. Some of the modeling options to be considered are: (a) discrete choices (e.g., trip-chaining or not); (b) discrete-continuous choices (e.g., using or not using the NJTPk and amount of usage); and (c) dynamic discrete choice models. The systematic component of the utility functions associated with the different alternatives will be formulated and assumptions will be made regarding the nature of the corresponding random component.

On the basis of the data that have already been collected, both from the panel of users and from the descriptive analyses, the research team will undertake a process of statistical estimation of the parameters of the choice models. This process will take advantage of commercially available estimation software. The significant experience of the research team in discrete choice modeling will undoubtedly be an asset during the estimation process.

The resulting models will enable the calculation of the elasticities of single occupant vehicles (SOVs), high occupancy vehicles (HOVs), and trucks with respect to toll price and the analysis of the correlations between user characteristics and changes in travel behavior. The study will shed light on whether NJTPk users perceive value pricing as an effective method for allocating capacity among different segments of passenger and freight users and on their perceptions of the efficiency and convenience of the toll collection and enforcement methods. To that effect, the travel surveys will be properly designed to ensure they include questions pertaining to users' perception. This information should prove useful for other decision-makers who are considering instituting value pricing.

In summary, the process discussed above will consist of:

- Taking into account the nature of the choice process being modeled select a modeling framework

- Formulating the corresponding systematic and random components of the utility functions
- Conducting statistical estimation of the parameters of the models
- Assessing the statistical significance and conceptual validity of the models
- Assessing econometric parameters of interest (e.g., elasticities)
- Using the models to sort out the effects of value pricing from the influences of other variables in the model.

### ***Focus Area III: System wide impacts (\$92,000)***

Traffic modeling will be performed using the before and after traffic data. The traffic models will enable the estimation of congestion levels and travel times as well as the corresponding economic impacts. From the congestion levels and travel times, the economic value of time savings/losses and the differential impacts on user classes will be calculated. Description of the main activities follows.

*Task 10 (\$24,000): Traffic modeling.* One of the major goals of value pricing is to modify users' behavior in such a way that the congestion on the priced facility is reduced. However, the implementation of value pricing may also lead to increased congestion on the alternative routes. For that reason, assessing the overall congestion impacts on both the priced facility and the alternative routes necessitates the use of traffic simulation models. In addition to the modeling of traffic flow on the network, the route and departure time choices of individual and / or classes of users have to be modeled. These route and departure time choice behavior models will be calibrated using the data obtained in the data collection step, and travel times estimated using floating car techniques and the corresponding traffic volumes collected by NJDOT and NJTA. A traffic model of the study network will be developed using an off-the shelf simulation tool that can be modified to include improved/calibrated route departure time choice models that can accurately capture the response of users to various value pricing schemes. These analyses, conducted for the relevant range of policy variables, will provide supporting evidence for both the general public and decision makers about the overall benefits of value pricing. The final model will be a simulation / assignment model that can provide an adequate representation the actual flow patterns in terms on the modeled network. It is also important to mention the

possibility of using more aggregate mathematical modeling type of approaches for this dynamic traffic assignment problem. However, based on the principal investors' experience, the use of simulation along with well-calibrated route / departure choice models appears to be more suitable for this kind of off-line planning studies.

*Task 11 (\$9,000): Estimate congestion levels and travel time savings/losses for before and after conditions.* Before and after traffic data collected on the NJTPK will be analyzed to determine the change in congestion levels and travel time savings/losses for both the priced facility and its alternatives. The time dependent nature of congestion will be taken into account while evaluating impacts of the value pricing on the congestion. This output can be used to calculate the potential savings for before and after conditions. The traffic models could be used, among other things, to separate the effects of EZ-PASS and value pricing upon total travel time in the network. This could be accomplished, once the models have been calibrated, by implementing in the model the increased capacity rates at toll booths of EZ-PASS lanes, and then implement in the model the new traffic patterns produced by value pricing.

*Task 12 (\$11,000): Estimate environmental impacts for before and after conditions.* It is always difficult to directly measure the emission levels on a large network such as the one that will be studied in this project. The emission models developed by FHWA can be used in this study. The change in congestion and traffic flow levels as a result of value pricing will definitely affect emissions on the turnpike and this change will be captured using the FHWA emission models embedded in the simulation / assignment model proposed above. These changes will be assessed for both the priced facilities and the corresponding alternatives to it.

*Tasks 13-14 (\$28,000): Estimate economic value of travel time savings. Differential impacts among user classes.* The traffic models estimated above will provide invaluable information about the travel time for the before and after conditions. On the basis of that information, the research team will estimate the travel time value for the different user classes (from the behavioral modeling) and the associated economic value of savings for the different user classes. These analyses will lay the foundation for the estimation of differential impacts of value pricing on the different user classes. The analyses will take into account the impact upon the users of the priced facility and the other main components of the transportation network in the area.

### ***Questions to be addressed***

This proposal has been designed to address a number of research topics that were listed in Table 1, at the beginning of the proposal. However, in order to summarize the research objectives pursued here, the research team has highlighted the key research questions that this project is intended to investigate. It is important to highlight the preliminary nature of these questions. This is because the specific details of the traffic behavioral patterns of the users of the NJTPk are not completely known, at this stage of the investigation. As soon as the project starts, the research team will meet with both the Policy Advisory Group and the Technical Advisory Group to produce the final set of questions to be addressed in this project as well the overall methodological approach to be used. The preliminary set of questions is shown in Table 3.

**Table 3: Research questions**

Has pricing had any effect upon driver behavior? If, so what is the nature of this change? Changes in mode choice? Change in departure time? Changes un route choice? Trip curtailment?
What behavioral changes take place over the long term?
Has pricing had any effect upon system performance? If, so in what way? Reduction of travel time? Reduction in traffic pollution? Trip curtailment? Congestion reduction?
How does the trip length affect driver behavior as a response to pricing?

### ***Organizational structure of the research team***

The project will be a multi-year joint collaboration between the CUNY's Institute for Urban Systems (CIUS), the Department of Civil and Environmental Engineering at Rutgers University (DCEE/RU), the Alan M. Voorhees Transportation Center at Rutgers University (VTC/RU), and the New York University's Rudin Center for Transportation Policy and Management (NYU/RC).

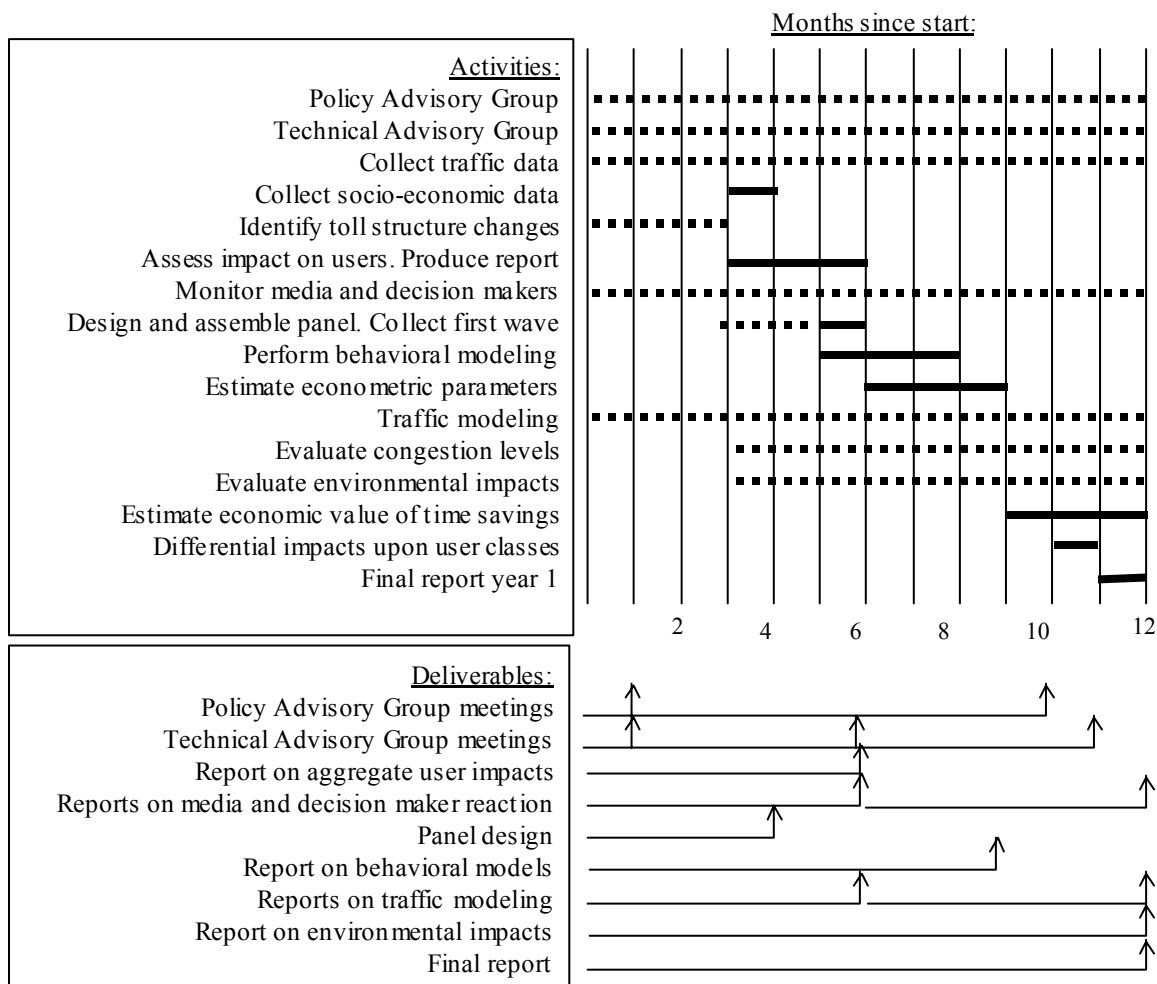
This project will be conducted in close collaboration with the New Jersey Department of Transportation (NJDOT) and the New Jersey Turnpike Authority (NJTA). Both agencies will provide oversight and guidance during this investigation.

The prime contractor will be the CUNY's Institute for Urban Systems (CIUS) and the Principal Investigator will be Professor José Holguín-Veras. The Co-Principal Investigator from DCEE/RU will be Professor Kaan Ozbay, the Co-Principal Investigator from VTC/RU will be its Director Martin Robins, and the Co-Principal Investigator from NYU/RC will be Mrs. Susan Kupferman.

Areas of responsibility:

- José Holguín-Veras (CIUS): Project management, descriptive analyses and behavioral modeling
- Kaan Ozbay (DCEE/RU): Descriptive analyses (jointly with CIUS), traffic modeling and environmental analyses
- Martin Robins (VTC/RU): Institutional coordination
- Susan Kupferman (NYU/RC): Monitoring media and stakeholders reaction to value pricing

## Timeline and deliverables



## ***References***

- New Jersey Turnpike Authority (1998), *Annual Report*, [Online], Available: <http://www.state.nj.us.turnpike/99annual.htm> [2001, Feb. 12].
- Strauss, R. 2000, 'Driving through the heart of a state', *New York Times*, Jan. 2, pp. 8-14.
- New Jersey Turnpike Authority (2001a), *New Jersey Turnpike Authority Facts*, [Online], Available: <http://www.state.nj.us.turnpike/facts.htm> [2001, Feb. 12]
- New Jersey Turnpike Authority (2001b), *The New Jersey Turnpike Authority Service Areas*, [Online], Available: <http://www.state.nj.us/turnpike/service.htm> [2001, Feb. 12]
- New Jersey Turnpike Authority (2001c), *New Jersey Authority Toll Rate Schedule*, [Online], Available: <http://www.state.nj.us.turnpike/tr.htm> [2001, Feb. 12]

## ***Budget***

The resources estimated for successful completion of this project are shown in Appendices I and II. The budgets are based on different assumptions. Budget I assumes that this project would cover all costs associated to monitoring the implementation of value pricing at the New Jersey Turnpike. This would include staff costs and the full cost of the \$140,000 for the first wave of the panel data. Budget II assumes that some of the staff and data collection costs are shared by the monitoring study of the value pricing project at the Port Authority of New York and New Jersey (PANYNJ).

### **Explanation of key budget items**

The budgets include \$140,000 that corresponds to the first wave of a 1,750 persons panel that would be contacted once a year to monitor behavioral changes. The costs for subsequent waves would be in the range of \$110,000 per wave (see Appendix III). This amounts to an unit cost of \$80/person which is at the lower end of unit costs. Similar studies, in which the Principal Investigator was involved in 1998 had unit prices between \$80 and \$100 per person. The sample size for the Northern section of the NJTPk was estimated from the estimated sample size for the entire length (that was estimated previously). The sample size for the entire length of the NJTPk was estimated as 3,000 under very crude assumptions, by both the Principal Investigator (who estimated 3,000 interviews) and the Eagleton Institute (that estimated between 2,000 and 5,000 interviews). Thus, 1,750 was used as the assumed sample size for the Northern section of the project, for budget purposes. The sample size will be refined as soon as the project starts.

The budgets include time of the key staff (Holguín-Veras, Ozbay, Robins and Kupferman), a part time researcher (Thorson), students, a transportation economist (Berechman), a traffic modeler (Mouskos), and a behavioral modeler that would be advisors to the project team. The matching funds are provided by City College of New York (release time), Rutgers University (release time), New Jersey DOT (traffic data), and the New Jersey Turnpike Authority (traffic data). The summary of budget figures for the first year is shown in Table 4.

**Table 4: Summary of budget figures**

Budget	Total	FHWA	Local match
I (All costs)	\$747,307	\$597,466	\$149,842
II (Shared costs)	\$597,209	\$477,468	\$119,741

### ***Summary of qualifications of key personnel***

**Dr. José Holguín-Veras**, received his B.Sc. in Civil Engineering, Magna Cum Laude, from the Universidad Autónoma de Santo Domingo, Dominican Republic, in 1981. He received his M.Sc. from the Universidad Central de Venezuela in 1984; and his Ph.D. from The University of Texas at Austin in 1996. He has received a number of awards, including the Milton Pikarsky Memorial Award in 1996, from the Council on University Transportation Centers – awarded to his research on intermodal freight transportation–, the CAREER Award from the National Science Foundation, and fellowships from the International Road Federation (1991), the Japanese International Cooperation Agency (1989), the Organization of American States (1982-1984). He has been Adjunct Professor of the Universidad Autónoma de Santo Domingo, Invited Lecturer of a number of Latin-American universities and Invited Professor at The California Polytechnic State University at San Luis Obispo. He joined the faculty at The City College of New York in August 1997. His professional experience includes demand modeling and economic analyses of land use-transportation projects, economic analyses of more than three hundred transportation projects, ranging from rural roads to intermodal transportation projects, in a number of different countries, in more than twenty-five major transportation projects. He has extensive modeling experience with discrete choice models (Random Utility Models), land use-transportation models, Input-Output models, and traditional UTPS applications to both freight and passengers. His professional experience includes the analysis of the intermodal alternatives for the trans-isthmian corridor that runs parallel to the Panama Canal. He has been consultant for international companies and financial institutions, including: The World Bank, The United Nations, The Inter-American Development Bank, Frederick Harris Inc., Delcanda Inc., and Louis Berger. He has published papers on the fields of transportation modeling, intermodal freight transportation, transportation economics and multicriteria decision making, information technology applications to transportation operations, simulation, and transportation planning. He has lectured in Venezuela, Panama, Singapore, Dominican Republic and the U.S. His research interests are in the areas of: freight transportation modeling, transportation economics, intermodal transportation, Intelligent Transportation Systems (ITS), transportation planning, and information technology. He has been a member of the expert panel on freight transportation modeling for the U.S. Department of Transportation, and member of the International Advisory Committee on Logistics for the Pusan National University in Korea. He is a member of: a) TRB

Committee on Intermodal Terminal Design and Operations (A2M03); b) TRB Committee on Freight Transportation Planning and Marketing (A1B02); c) Intelligent Transportation Systems of America's Technical Committee on Commercial Vehicle Operations; e) American Society of Civil Engineers; and has served as referee for the major professional journals.

**Professor Kaan M.A. Özbay**, received his B.S. in Civil Engineering in 1988 from Bogazici University, Istanbul, Turkey, his M.S. in 1991 in Civil Engineering (Transportation) from Virginia Tech and his Ph.D. in Civil Engineering (Transportation) in 1996. Dr. Özbay's research interest in transportation covers advanced technology applications in ITS, incident management, development of real-time control techniques for traffic, application of artificial intelligence and operations research techniques in network optimization, and development of simulation models for automated highway systems. Dr. Ozbay joined Rutgers University Department of Civil and Environmental Engineering as an assistant professor in July, 1996. He is also the Associate Director of the newly established Rutgers “Center for Advanced Infrastructure and Transportation (CAIT)” sponsored by the Federal Highway Administration’s University Transportation Centers (UTC) program. As the associate director of CAIT, he is mainly responsible of the Center’s Intelligent Transportation Systems (ITS) research projects and other related educational and administrative activities. Dr. Ozbay is the recipient of the prestigious National Science Foundation (NSF) CAREER award. This is a four year award given to young tenure track faculty that has the highest potential for research and education. He has also received the Rutgers School of Engineering Faculty Achievement Award in 2000. He is the four time recipient of “Rutgers University Faculty Academic Service” award. Dr. Ozbay co-authored a book titled “Incident Management for Intelligent Transportation Systems” published by Artech House publishers in 1999. In addition to this book, he is also the co-author of the book titled "Feedback Control Theory for Dynamic Traffic Assignment", Springer Verlag with Dr. Pushkin Kachroo of Virginia Tech. Dr. Ozbay published more than 30 papers in scholarly journals and conference proceedings. Recently, he was the chairman of several ITS sessions of the SPIE conferences in 1997 and 1998 and 2 sessions at the IEEE SMC conference held at San Diego in 1998. He is also the co-editor of the 1997 SPIE ITS session proceedings published by SPIE. He is currently Principal Investigator of several Intelligent Transportation related projects funded by NJDOT and USDOT through “Center for Advanced Infrastructure and Transportation (CAIT)”. He is also the co-principal investigator of a new project titled “Integrative Freight Simulation”

funded by NSF ETI program. At Rutgers University he recently completed two projects namely, "Cost of Transportation in New Jersey" sponsored by the New Jersey Department of Transportation (NJDOT) and the University Transportation Research Center at CUNY and "Pavement Deterioration Models" sponsored by NJDOT. Among other projects completed by him during last 5 years are, "Technical Support to Incident Management" sponsored by the Virginia Tech Center for Transportation Research and co-principal investigator of projects titled "Logical and Physical Simulation of Automated Dedicated Bus Lanes" sponsored by the University Transportation Research center at CUNY and "Alternate Bus Routing System Evaluation Project" funded by the New Jersey Highway Authority. Between 1993 and 1996, Dr. Ozbay was a research associate and senior research associate at the Virginia Tech Center for Transportation Research. At the Center, he was the co-principal investigator and project manager of the "Wide-Area Incident Management Expert System" project sponsored by FHWA/VDOT and the co-principal investigator of the "Dynamic Network Optimization", and "Automated Incident Management", projects sponsored by the FHWA ITS Research Center of Excellence. He was also the co-principal investigator of the "Mid-Tech Corridor Intelligent Transportation Project: Johnson City Tennessee Parking and Routing Management System Evaluation" project subcontract to Virginia Tech funded by FHWA and Johnson City.

**Martin E. Robins** has a distinguished 25-year career in the field of transportation policy and planning. He presently serves as Director of the Transportation Policy Institute, a unit of the Alan M. Voorhees Transportation Center within the Edward J. Bloustein School of Planning and Public Policy at Rutgers University. Mr. Robins is responsible for implementing a program of policy research and public forums on transportation-related issues in the New Jersey – New York Metropolitan Region. He recently helped organize a regional forum on variable pricing with the Regional Plan Association.

Before coming to Rutgers, Mr. Robins held numerous high profile positions with state and bi-state agencies including: New Jersey Department of Transportation, New Jersey Transit and the Port Authority of New York and New Jersey. He began his transportation career as Director of the Department of Transportation's Office of Policy Analysis in the late 1970's and led the team of policy analysts that prepared the problem statement and drafted the legislation which led to the creation of New Jersey Transit. From 1980 to 1983, he then served as Deputy

Executive Director of NJ Transit and oversaw the purchase of Transport of New Jersey and Conrail commuter rail operations. Mr. Robins served as Director of Planning and Development for the Port Authority of New York and New Jersey from 1983 to 1987. There he dealt with issues surrounding toll increases and collection. From 1988 to 1994, he was Director of the NJ Transit's Waterfront Transportation Office and was responsible for the planning and environmental studies for the recently opened Hudson-Bergen Light Rail Line. In his prior position, he served as Project Director of "Access to the Region's Core," a bi-state, multi-agency joint planning venture to examine the need for a new trans-Hudson passenger rail tunnel. Mr. Robins is a graduate of Princeton University and Harvard University Law School. He recently served for three years as Chairman of the Planning Board in the Town of Westfield.

**Susan Kupferman** has twenty years of experience in multi-modal transportation planning, policy, project management, finance, administration, government relations and communications. She received a Bachelor of Science in 1979 and a Master of Arts in 1981 from the State University of New York at Albany. In February of this year Ms. Kupferman was appointed Co-Director of the Rudin Center for Transportation Policy and Management. Prior to accepting this appointment she served as the Metropolitan Transportation Authority's Deputy Director for Policy, Planning and Capital Programming where she was senior advisor to the Executive Director and Chairman of the Board of the largest transportation provider in North America. Her duties included the planning of large-scale mass transit projects and the development and implementation of a multi-billion dollar capital program. Her professional experience also included serving as the New York State Thruway Authority's Director of the Department of Strategic Planning and External Affairs where she was responsible for planning and project management; Federal, State and local government relations; media relations and public information, and marketing and promotion. During this time she received the American Planning Association's 1996 National Planning Award for Comprehensive Planning in a Large Jurisdiction, the 1996 Urban Design Award from The American Institute of Architects, and the 1996 Top Honor Award from the Waterfront Center. Prior to joining the Thruway Authority, Ms. Kupferman served as Assistant Secretary for Transportation for the Governor of New York. During her four year tenure in this position she was responsible for the development of the Governor's annual transportation program and policy agenda – reflected in the *State of the State* address to the Legislature, the transformation of this agenda into legislative initiative, and the

necessary legislative negotiation process to ensure that Executive proposals were memorialized in law. Ms. Kupferman also spent six years working for the New York State Legislature on transportation finance. She has participated in the activities of the American Planning Association, the American Public Transit Association, the Waterfront Center, the Transportation Research Board and the High Speed Rail/Maglev Association. Throughout her career Ms. Kupferman has appeared before a variety of organizations and at forums including Congressional Committees and the Transportation Research Board.

**Professor Joseph Berechman** is currently a Visiting Scholar at the University Transportation Research Center working both at Rutgers and CCNY. He is an international consultant on transportation investments and has conducted economic analysis to numerous transportation projects; a Professor in the Public Policy Program and Economics Department and a faculty member of Social Science at Tel-Aviv University, Israel. Dr. Berechman received his Ph.D. from the University of Pennsylvania (Economics and City Planning. Dr. Berechman's major areas of interest are: transportation systems analysis and planning, policy analysis and evaluation, transportation and urban economics, and urban modeling. His current consulting and professional activities include: Associate Editor, Journal of Transportation Research A (1993-present); Advisor, Netherlands, Ministry of Transport (1996-1997); Advisor, UK Council for Scientific Research, (1995-1996). He has been a member of the Editorial Advisory Board, Journal of Transportation Research (1990-1992); European Science Foundation (1986-present). International Network on Transportation, Communication and Mobility; Member of the Policy Analysis Task Group, Sub Group on Deregulation Policy. His major publications include the following books: Transport and Land Use (with H. Kohno, K. Button and P. Nijkamp, eds.), Edward Elgar Publishing Ltd., 1996; Public Transit Economics and Deregulation Policy, North Holland, 1993; Transportation in Unified Europe: Policies and Challenges (with D. Banister), North Holland, 1993. Guest Editor: Special Issue on Transportation Policy In Europe, Transportation Research A, March 1992. For the past few years Professor Berechman has been working extensively on issues related to the impact of transportation investment on urban and regional economic development. Early work on this subject included the development of a simulation model to assess the impact of a Rapid Light Rail investment on urban development. More recently he focused on the economic underpinnings of the relationships between transportation infrastructure improvement and local and regional growth. The policy implications

of these relationships are a major focus of his work. Currently, he is writing a book (with David Banister) on the subject.

**Professor Robert Paaswell** has been involved in transportation operations, management and planning since the late 1960s. While a Professor of Civil Engineering at State University of New York at Buffalo (1964-1982), Paaswell organized and directed the Center for Transportation Studies and Research. The Center was responsible for a number of important studies including a seminal study on the transportation disadvantaged, an innovative analysis of the economic and social impacts of the Buffalo Light Rail System, Port of Buffalo studies and energy demand studies. During the period 1980-1982, Paaswell was Chairman of the Urban Planning Department at SUNY Buffalo. Paaswell served as Director of the Urban Transportation Center at the University of Illinois, from 1982-1986. During that period he worked with the major transit systems, private providers and other Illinois transit providers. He initiated a training program in mainland China to address surface transportation issues. From 1986-1989 Paaswell served as Executive Director (CEO) of the Chicago Transit Authority, the second largest system in the U.S. In that position he initiated Strategic Planning, Program Based Budgeting, Fare Restructuring and a number of other modern initiatives to that property. Paaswell is now Director of the University Transportation Research Center (UTRC), a federally funded center that provides research and training to transportation professionals throughout USDOT Region II. Highly cited for his work in transportation, Paaswell has served on the Executive Committee of the Transportation Research Board, on the Transit Cooperative Research Program Board, and on the Institute of Transportation Engineers Transit Council. He has received the Medal for Superior Achievement from the Secretary of USDOT. He is listed in Who's Who in the World, Who's Who in America, Who's Who in Engineering and Who's Who in Finance and Industry.

## ***Resumes of key personnel***

### **José Holguín-Veras**

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#### **1. EDUCATION**

- ❖ Ph. D., University of Texas at Austin, 1996
- ❖ Magister Scientiarum, Universidad Central de Venezuela, 1984
- ❖ Civil Engineer, Universidad Autónoma de Santo Domingo, 1981

#### **Fellowships and Awards**

- ❖ Recipient of the CAREER Award from the National Science Foundation (2001)
- ❖ Recipient of the Milton Pikarsky Memorial Award, 1996 (Council of University Transportation Centers)
- ❖ Fellow of:
  - ◆ International Road Federation (IRF), 1991
  - ◆ Japanese International Cooperation Agency (JICA), 1989
  - ◆ Organization of American States (OAS), 1982-1984
- ❖ Magna Cum Laude in Civil Engineering, Universidad Autónoma de Santo Domingo, 1981.

#### **Other relevant courses and seminars**

- ❖ *Port and Harbor Engineering*, Port and Harbor Research Institute, Kurihama, Japan, 1989.
- ❖ *Geometric Design-Traffic Management*, Venezuelan Society of Highway Engineers, 1983.

#### **2. AREAS OF PROFICIENCY**

##### **Transportation Planning/Intelligent Transportation Systems**

- ❖ Proficient in the use of demand models for policy analysis and transportation system planning. Participated in three national transportation plans and fifteen major urban and regional transportation studies. Highly proficient in the use of advanced modeling techniques, ranging from Random Utility Models, to Land-Use transportation models, and traditional UTPS approaches, including network applications to transportation problems.

##### **Intermodal Freight Transportation and Commercial Vehicle Operations**

- ❖ The research conducted on the area of container transportation received the Milton Pikarsky Memorial Award, a U.S. award, from the Council of University Transportation Centers (CUTC) in 1996. Proficient in the analysis of commercial vehicle operations and intermodal transportation of containers. Conducted research on market penetration and factors determining propensity to use advanced information technology. Principal Investigator of a number of research projects on intermodal freight transportation modeling.

##### **Transportation Economics**

- ❖ Strong background in transportation economics, having performed the economic evaluation of more than three hundred transportation projects, including land use projects, transit projects, freeways, two suburban and interstate highways, port projects, rail projects, and rural roads. Has conducted advanced research on price differentiation theory and

congestion pricing application to container terminals. Has been consultant for the major international companies and international organizations.

### **Infrastructure Planning**

- ❖ Strong background in the areas of: highway design, demand forecasting and economic analysis of urban highways and rural roads. Participated in planning and design of three freeways, two intercity roads, two hundred rural roads, airports, rail and maritime projects in a number of different countries. International consultant in the area of Infrastructure Planning and Modeling. Implemented one Pavement Management System.

### **Traffic Engineering**

- ❖ Proficient in traffic engineering and traffic flow theory. Experience in intersection control, traffic signalization and coordination. Participated in two traffic signal coordination studies and advised eight different municipal planning organizations.

## **3. EXPERIENCE**

### **Academic**

- ❖ Assistant Professor of Civil Engineering, The City College of New York (1998). Teaching courses on: GIS Transportation Modeling, Intelligent Transportation Systems, Multimodal Freight Transportation and Logistics, Highway Design, Traffic Control and Transportation Economics. Conducting research on Multimodal Freight Transportation, Intelligent Transportation Systems and Transportation Economics.
- ❖ Visiting Assistant Professor of Civil Engineering, The City College of New York (1997).
- ❖ Visiting Professor, California Polytechnic State University, San Luis Obispo (1996-1997). Teaching graduate and undergraduate courses in Traffic Engineering, Highway Design and Transportation Planning.
- ❖ Adjunct Professor of Transportation Economics and Transportation Planning (1984-1991), and Port Engineering (1989-1991), Universidad Autónoma de Santo Domingo.
- ❖ Lecturer of Urban Transportation Planning at the Graduate Course in Transportation Planning, Universidad Autónoma de Santo Domingo 1985-1986.

### **Administrative**

- ❖ Deputy Director of the Transportation Planning Directorate, Ministry of Public Works, October 1986-August 1987.
- ❖ Academic Coordinator of the Graduate Course in Transportation Planning, Universidad Autónoma de Santo Domingo 1985-1986.
- ❖ Head of the Transportation Planning Department, Ministry of Public Works, 1984-1986.
- ❖ Head of the Special Studies Unit, Ministry of Public Works, January 1981-August 1984.

### **Research**

- ❖ *New Jersey's Link to the 21<sup>st</sup> Century: Maximizing the Impact of Infrastructure Investment* (New Jersey Department of Transportation), 2000-2002 (Principal Investigator).
- ❖ *Strategic Plan for the Development of the Regional Freight Model* (New York Metropolitan Transportation Council), 2000 (Principal Investigator).
- ❖ *Operational Evaluation of the Integrated Incident Management System (IIMS)* (New York State Department of Transportation), 2000-2001 (Principal Investigator).
- ❖ *Trip Generation at Container Terminals* (PSC-CUNY), 1999-2000
- ❖ *Investigation of the Relationship Between Commodity Based Trip Length Distribution and Vehicle Based Trip Length Distribution for Freight Demand Modeling* (University Transportation Research Center) 1999-2000.

- ❖ *Range of Applicability of Priority Systems*, 1995-1996.
- ❖ *Landside Terminal Priority Systems for Intermodal Containers*, 1994-1995.
- ❖ *Assessment of the Tradeoffs Among Container Handling Technologies*, 1991-1993.
- ❖ *Ex-post Evaluation of the Right-Turn-on-Red*, May, 1987.
- ❖ *On the Calibration of Leibbrand's Model*, January-March 1987.
- ❖ *Quantification of the Demand Curves for the Regional Transportation System of Dominican Republic*, Universidad Autónoma de Santo Domingo, November 1986.
- ❖ *Development of a Model for the Quantification of the Vehicular Supply in Freight Transportation*, Universidad Autónoma de Santo Domingo, April 1983, July 1984.

#### 4. LIST OF SELECTED PROJECTS AND PARTICIPATION

- ❖ *North East Intermodal Transportation Corridor* (September, 2000- March 2001). This project included freight demand modeling for the New York City metropolitan region (funded by the Port Authority of New York and New Jersey).
- ❖ *Integrative Freight Market Simulation* (Principal Investigator). (National Science Foundation, September 2000- August 2001). This project is intended to develop a new modeling framework for freight movements on the basis of a market equilibrium formulation.
- ❖ *New Jersey's Links to the 21<sup>st</sup> Century* (Principal Investigator) (New Jersey Department of Transportation, January 2000-December 2002). This project will model the relationship between economic development and transportation for Northern New Jersey to help define transportation policy.
- ❖ *Strategic Plan for the Development of the Regional Freight Model* (New York Metropolitan Transportation Council, January-December 2000). This multiuniversity research project will define a development process for the regional freight model to be developed by NYMTC.
- ❖ *Operational Evaluation of the Integrated Incident Management System (IIMS)* (New York State Department of Transportation), 2000-2002 (Principal Investigator). The NYSDOT is going to implement an integrated incident management system, this project is intended to assist the design process to ensure consistency with project objectives and stakeholders needs.
- ❖ *Demand Modeling for the Anillo Metropolitano Project*, Guatemala (January-June 1999). This project included the demand modeling and forecast (both freight and passengers) of a major bypass road in Guatemala City.
- ❖ *Analysis of the Transportation Alternatives for the Grain Terminal*, Dominican Republic, April-July 1991. It included the analysis of the terminal operations, multimodal alternatives, logistics and inventory policy for a new grain terminal.
- ❖ *Analysis of the Santo Domingo-San Cristóbal Highway*, Dominican Republic, January-May 1989. It included demand forecast, analysis of the alternatives and the economic analysis.
- ❖ *National Study of the Service Sector in the Dominican Republic*, November 1988-February 1989. Financed by UNCTAD, this project focused on the assessment of the impacts of free market policies upon the transportation system, tourism and export sector. This analysis helped shape the governmental position at the Uruguay Round of GATT.
- ❖ *Panama's National Transportation Plan*, January-April 1988. It consisted of the calibration of the modal split models, analysis of the intermodal corridors, economic analysis of the airport projects (including the analysis of the Marcos Gelabert airport), the analysis of

pipelines, economic analysis of railroads and port projects (including port simulation), and formulation of the final investment plan.

- ❖ *Formulation of the Widening Project of the Simon Bolivar Avenue*, Dominican Republic, August-November 1987. It included the design of alternatives, demand forecast and economic analysis.
- ❖ *Institutional Development of the Dominican Port Authority*, Dominican Republic, September-October 1987. It included demand forecast for the port system and the corresponding simulations, under contract with PRC-Harris. This project was financed by Interamerican Development Bank.
- ❖ *Rehabilitation Project of Rural Roads (Loan 98-FIDA-World Bank)*, Dominican Republic, August-October 1987. It was comprised of the data collection planning, inspection of 300 km of rural roads, the definition of the alternatives and their economic analysis. This project was financed by the World Bank.
- ❖ *Economic Analysis of the Extension of the J.F. Kennedy Avenue*, Dominican Republic, May-June 1987. It included the demand forecast and the economic analysis.
- ❖ *Ex-post analysis of the Nunez de Caceres Avenue*, Dominican Republic, May 1987. It included the demand forecast and the economic analysis.
- ❖ *Urban Plan for the Northern Zones of Santo Domingo City*, Dominican Republic, March-April 1987. This project considered the settlement of 250,000 people over a five year period. The transportation plan for this urban development was developed.
- ❖ *Evaluation of 180 km. of Rural Roads*, Dominican Republic, March-April 1987. Under contract with the Interamerican Development Bank, it included the formulation and economic evaluation of the alternatives.
- ❖ *Diagnosis and Perspectives of the Arterial System of Santo Domingo City*, Dominican Republic, January-February 1987. It was comprised of the comprehensive analysis of the transportation needs and the demand forecast for the network, oriented to the analysis for the project of the fourth bridge over the Ozama river.
- ❖ *Transportation Demand Forecast*, January-August 1986, Transportation Planning Department, Ministry of Public Works, Dominican Republic. It included the calibration of the demand models and the definition of the alternatives.
- ❖ *Pavement Maintenance and Rehabilitation Plan*, January-December 1986, Transportation Planning Department, Ministry of Public Works, Dominican Republic. It included the diagnosis of the network, the formulation of alternatives, and the implementation of a Pavement Management System.
- ❖ *Definition of the Fiscal Policy for the Transportation Sector*, November 1986-May 1987, Transportation Planning Department Ministry of Public Works, Dominican Republic.
- ❖ *Analysis of the Railway Project La Vega-Santo Domingo*, Dominican Republic, August, 1985. Under contract with DELCANDA Intl. the demand forecast for passengers and freight was done.
- ❖ *Definition of the Optimum Policy of Truck Import*, Dominican Republic, January 1983-August 1984. It included the definition of the import policy, the forecast of transportation demand and supply, (including the development of fleet deterioration models), and the development of a simulation system for the analysis of the alternatives and the quantification of their impacts.

- ❖ *Comprehensive Study of the Transportation System of the Capital Region*, Venezuela, June 1983- August 1984. The purpose of this study was the definition of an integrated policy of land use and transportation that contributes to the decentralization of Caracas.
- ❖ *Comprehensive Study of the Transportation System of the East Coast of the Maracaibo Lake*, Venezuela, February-May, 1983. It included the analysis of different policies of land use and transportation by using transportation and land use integrated models.
- ❖ *Institutional Study of the Ministry of Public Works*, Dominican Republic, 1982. It encompassed traffic studies, the definition of the optimum axle load for the highway system, and the analysis of the toll system.
- ❖ *Planning of the O-D Survey of Santo Domingo City*, Dominican Republic, December 1980-April 1981. It included the definition of the statistical frame and planning of the data collection process.
- ❖ *Traffic Signal Coordination for the John F. Kennedy and Abraham Lincoln Avenues*, Dominican Republic, October-November 1979. It included the design of the system and the economic analysis.

## 5. CURRENT PROJECTS AND PARTICIPATION

- ❖ *Integrative Freight Market Simulation*. (RF#40306-00-01) (Principal Investigator.) Funded by the National Science Foundation, September 2000- August 2001. Total budget = \$84,500 CCNY component = \$60,000.
- ❖ *New Jersey's Links to the 21<sup>st</sup> Century* (RF#70131-01-11) (Principal Investigator. Professor R. Paaswell is Project Manager) Funded by the New Jersey Department of Transportation and the U.S. Department of Transportation, July 1999-September 2002). Total budget = \$650,000; CCNY component = \$425,000 (1<sup>st</sup> year = \$225,000; 2<sup>nd</sup> year = \$200,000).
- ❖ *Strategic Plan for the Development of the Regional Freight Model* (RF# 55332-01-02) (Principal Investigator. Faculty members from other universities have subcontracts.) Funded by the New York Metropolitan Transportation Council, January-December 2000). Total budget = \$110,000; CCNY component = \$65,000.
- ❖ *Operational Evaluation of the Integrated Incident Management System* (Principal Investigator) Funded by the New York State Department of Transportation), January 2000-2002 (Principal Investigator). Total budget = \$110,000; CCNY component = \$110,000 (1<sup>st</sup> year = \$55,000; 2<sup>nd</sup> year = \$55,000).
- ❖ *Nighttime Workzone Standards (1<sup>st</sup> Phase)* (Principal Investigator. Professor Kaan Ozbay, Rutgers University, is Co-PI) Funded by the New Jersey Department of Transportation and the U.S. Department of Transportation. Total budget = \$70,000; CCNY component = \$60,000.
- ❖ *Trip Generation at Container Terminals* (RF#61424-01-30 and RF#62481-00-31) (Principal Investigator) Funded by the Professional Staff Congress of The City University of New York. Total budget = \$8,000; CCNY component = \$8,000.

## 6. PUBLICATIONS

### Refereed publications

Holguín-Veras, J. and R. Paaswell.. “New York Regional Intermodal Freight Transportation Planning: Institutional Challenges.” Invited Paper. Forthcoming at a Special Issue of the Transportation Law Journal on Intermodal Transportation (September 2000)

- Holguín-Veras, J. and E. Thorson. "Modeling Commercial Vehicle Empty Trips with a First Order Trip Chain Model," Report published by the University Transportation Research Center (Forthcoming in Transportation Research Part B)
- Holguín-Veras, J., "Revealed Preference Analysis of the Inter-vehicle Competition in the Trucking Industry," (Forthcoming in the Journal of Transportation Engineering, American Society of Civil Engineers)
- Holguín-Veras, J., "Optimal Storage Pricing with Capacity Constraint and Elastic Arrivals in Intermodal Terminals," (being reviewed by Transportation Research Part B, December 1999)
- Holguín-Veras, J., Y. López, and A. Salam. "Trip Generation at Marine Container Terminals." In process of review.
- Holguín-Veras, J. "On the Attitudinal Characteristics of Motor Carriers Toward Container Availability Systems." Invited Paper. International Journal of Services Technology and Management, Vol.1 Nos.2/3, pp. 140-155, November 2000. (Sole author.)
- Holguín-Veras, J. "A Framework for an Integrative Freight Market Simulation." Invited Paper. Published by the IEEE 3rd Annual Intelligent Transportation Systems Conference ITSC-2000, Dearborn Michigan October 2000.
- Holguín-Veras, J. and E. Thorson. "An Investigation of the Relationships Between the Trip Length Distributions in Commodity-based and Trip-based Freight Demand Modeling." Transportation Research Record #1707 pp. 37-48, September 2000.
- Holguín-Veras, J. and S. Jara-Díaz. "Optimal Space Allocation and Pricing for Priority Service at Container Ports." Transport Research Part B 33(2), pp. 81-106, January 1999.
- Holguín-Veras, J. and Jara-Díaz, S. "Practical Implications of Optimal Space Allocation and Pricing," in Ports' 98, Vol 1, pp. 89-97, Michael Kraman, ed. March 1998. ISBN 0-7844-0329-5
- Holguín-Veras, J., S. Jara-Díaz, and C.M. Walton. "Toward New Paradigms of Container Terminal Modeling." Journal of Infrastructure Vol. 3 (2), pp. 3-9, February 1998.
- Holguín-Veras, J. and C.M. Walton. "On the Application of Combined Models to Port Simulation. Case Study: Gantry Crane Operations." Journal of the Transportation Research Forum, Vol. 37, No. 1, pp. 29-45, 1998.
- Holguín-Veras, J. and C.M. Walton. "Implementation of Priority Systems for Containers at Marine Intermodal Terminals." Transportation Research Record 1602, pp. 57-64, Transportation Research Board, 1997.
- Holguín-Veras, J. "Alternative Modeling Framework for Pavement Serviceability Analysis." Journal of Transportation Engineering, A.S.C.E. Nov/Dec 1997, Vol 123, No. 6, pp. 478-483.
- Holguín-Veras, J. and C.M. Walton. "On the Development of a Computer System to Simulate Port Operations Considering Priorities." Proceedings of the 1996 Winter Simulation Conference (ed. J.M. Charnes, D.J. Morrice, D.T. Brunner, and J.J. Swain), pp. 1471-1478. The Institute of Electrical and Electronic Engineers, New Jersey, December 1996.
- Holguín-Veras, J. and C.M. Walton. "The Role of Information Technology on the Implementation of Priority Systems for Intermodal Containers." Proceedings of the 3rd Annual World Congress on Intelligent Transportation Systems. Orlando, Florida, Oct 1996.
- Holguín-Veras, J. and C.M. Walton. "An Empirical Investigation of Alternative Approaches to the Simulation of Gantry Crane Operations." Proceedings of the 38th Annual Meeting of Transportation Research Forum, Vol. 2, pp. 459-477. San Antonio, Texas, October 1996.
- Holguín-Veras, J. and C.M. Walton. "The State of the Practice of Information System and Information Technology at Marine Container Ports." Transportation Research Record 1522, pp. 87-93, Transportation Research Board, 1996.

- Holguín-Veras, J. "Comparative Assessment of the Analytic Hierarchy Process and Multiattribute Value Functions for Highway Evaluation: A Case Study." *Journal of Transportation Engineering*, A.S.C.E., Vol. 121, No. 2, March/April, 1995 pp. 191-200.
- Holguín-Veras, J. "The Calibration of the Leibbrand Model." Published by the Second Transportation Congress, Santo Domingo, June 1987.
- Holguín-Veras, J. "Public Transportation: Informal vs. Formal Systems." Published by the Second Transportation Congress, Santo Domingo, June 1987.
- Holguín-Veras, J. et al. "Computational System for O-D Survey." First (Latin American) Congress of Transportation Engineering, Popayan, Colombia 1982.

#### **Non-refereed publications**

- Holguín-Veras, J. and C.M. Walton. "The Performance Analysis of Priority Systems." Research Report SWUTC/97/467304-1, Center for Transportation Research, The University of Texas at Austin, August 1997, Austin, TX 78712.
- Holguín-Veras, J. and C.M. Walton. "Range of Applicability of Priority Systems." Research Report SWUTC/97/467304-2, Center for Transportation Research, The University of Texas at Austin, August 1997, Austin, TX 78712.
- Holguín-Veras, J. and C.M. Walton. "PRIOR, A Computer System for the Simulation of Port Operations Considering Priorities." Research Report SWUTC/96/ 721928-2, Center for Transportation Research, The University of Texas at Austin, Oct. 1995, Austin, TX 78712.
- Holguín-Veras, J. and C. Walton. "The Calibration of PRIOR, A Computer System for the Simulation of Port Operations Considering Priorities." Report SWUTC/96/721928-1, Center for Transportation Research, University of Texas at Austin, Oct. 1995, Austin, TX 78712.
- Holguín-Veras, J. and C. Walton. "The Role of Information Technology on the Implementation of Priority Systems and The State of the Practice of Information System and Information Technology on Marine Container Ports." Research Report SWUTC/96/721928-3, Center for Transportation Research, University of Texas at Austin, October 1995, Austin, TX 78712.
- Holguín-Veras, J. and C.M. Walton. "A Categorized and Annotated Bibliography on the Performance Analysis of Port Operations." Research Report SWUTC/95/721912-1, Center for Transportation Research, University of Texas at Austin, March 1995. Austin, TX 78712.
- Holguín-Veras, J. and L. Simó. "Methodological Framework for the Maintenance and Rehabilitation Plan." Ministry of Public Works, Transportation Planning Department, November-December 1984.
- Holguín-Veras, J. "An Approach to the Study of the Effective Supply in Freight Transportation." The Universidad Central de Venezuela, July 1985.
- Holguín-Veras, J. "Development of a Model for the Quantification of the Vehicular Supply in Freight Transportation." The Universidad Central de Venezuela, July 1985.
- Holguín-Veras, J. "Definition of the Optimum Policy of Truck Import." Dominican Republic 1984-1989. Ministry of Public Works, November 1984.
- Holguín-Veras, J. et al. "The Definition of the Optimum Axle Load in the Dominican Republic." Ministry of Public Works, 1982.
- Holguín-Veras, J. and M. Rubio. "Diagnosis of the Toll System." Ministry of Public Works, 1982.
- Holguín-Veras, J. et al. "Manual for the O-D survey." Ministry of Public Works, 1982.

#### **7. COMMITTEE WORK AT CCNY**

- ❖ School of Engineering Dean Search Committee (December 1999-June 2000)
- ❖ Curriculum/ABET Committee (1997-2000)

## **8. STUDENT GUIDANCE**

- ❖ Master students: Mostafa Kamal, Andrew Sakowicz, Abdus Salam, Amr Ibrahim.
- ❖ Doctoral students: Judith Peter, Yuan-yuan Cao, Chang Guang, Victor Ochieng, Ellen Thorson.

## **9. COURSE AND CURRICULUM DEVELOPMENT**

- ❖ New courses at CCNY:
  - ◆ CE264: Civil Engineering Data Analysis
  - ◆ CE5741: ITS Fundamentals and Applications
  - ◆ CE 5542: GIS Transportation Modeling
- ❖ Re-designed courses at CCNY:
  - ◆ CE5602: Transportation Economics
  - ◆ CE5635: Traffic Engineering (redesigned as a full multimedia course)

## **10. PUBLIC OUTREACH ACTIVITIES**

- ❖ Liaison with the Association of Dominican Engineers.
- ❖ Featured in newspapers articles (El Siglo); and TV programs (CBS News channel 47, February 3, 1999).
- ❖ Co-organizer of the Award to Meritorious High School Students (held at CCNY, June 11, 1999) that gave awards to 300 outstanding High School students of Dominican descent. Fifteen hundred people attended the Award Ceremony at the Great Hall.
- ❖ Co-organizer of the Award to Meritorious High School Students (to be held at CCNY, June 11, 2000) that will gave awards to 300 outstanding High School students of Dominican descent. Fifteen hundred people are expected to attend the Award Ceremony at the Great Hall of CCNY.
- ❖ Speaker at the Dominicans 2000 Conference (held at CCNY, February 2000). The main objective of this conference was to outline an agenda for the Dominican community in the U.S. It attracted 1,400 participants.
- ❖ Articulated a collaboration agreement between CCNY and the Instituto Tecnológico de Santo Domingo, INTEC (Dominican Republic) for teaching and research on transportation. The agreement was signed by President Y. Moses and President Rafael D. Toribio Domínguez on the 29<sup>th</sup> of July, 1998.
- ❖ Articulating a collaboration agreement between CCNY and the Universidad Central de Venezuela (Venezuela) for teaching and research on transportation.

## **11. PROFESSIONAL ACTIVITIES**

- ❖ Participation in professional societies and research panels:
  - ◆ Member of a panel of three National experts that will supervise and advise the "Research and Development of Destination, Mode, and Routing Choice Models for Freight." The objective of this project is to develop a freight demand modeling system for the U.S. Department of Transportation Research and Special Programs Administration, Volpe National Transportation Systems Center. It is funded as part of Phase II of a Small Business Innovative Research (SBIR) project.
  - ◆ Member of the Board of Directors of the Community University Consortium for Regional Environmental Justice (CUCREJ), representing the University Transportation Research Center (since 1999)
  - ◆ Member of the Council on Transportation (since 1999).

- ◆ Member of the International Advisory Committee of the "Brain Korea" (BK) 21 Logistics Team sponsored by the Ministry of Education in Korea at the Pusan National University (since 2000).
- ◆ Transportation Research Board Technical Committee on Intermodal Freight Terminal Design and Operations A2M03 (since 1995)
- ◆ Transportation Research Board Technical Committee on Freight Transportation Planning and Marketing (A1B02) (since 1998)
- ◆ American Society of Civil Engineers (since 1999)
- ◆ Professional Engineer, New York (since 2000)
- ◆ Member of Colegio Dominicano de Ingenieros, Arquitectos y Agrimensores (Board of Engineers of Dominican Republic) since 1984.
- ◆ Member of the Directive Board of the Colegio Dominicano de Ingenieros, Arquitectos y Agrimensores (1985-1986).
- ❖ Invited lectures and chairmanships at professional conferences:
  - ◆ Invited as guest speaker at the Rebuild New York Conference, organized by Mr. Alan Hevesi, New York City Comptroller (March 28, 2000).
  - ◆ Invited by the Government of Singapore to lecture on freight transportation and transportation economics (November 1999).
  - ◆ Invited to lecture by the Federal Highway Administration on Congestion Pricing and Commercial Vehicle Traffic (January 1999).
  - ◆ Chairman of the session on Data Envelopment Analysis (DEA) at the Data Connection Conference, New York December 1997.
  - ◆ Chairman of the session on Strategic Data Sharing Alliances, organized by the Working Group on New York City Area Data, New York Metropolitan Transportation Council (NYMTC) January 1998.
- ❖ Referee for the following professional journals:
  - ◆ Decision Support Systems;
  - ◆ 7th and 8th World Conferences on Transport Research;
  - ◆ Transportation Research Record;
  - ◆ Journal of the Transportation Research Forum;
  - ◆ Transportation Research A, B and C;
  - ◆ Journal of the American Society of Civil Engineers.

## 12. LANGUAGES

	<b>Speak</b>	<b>Write</b>	<b>Read</b>
English	Fluently	Fluently	Fluently
Spanish	Fluently	Fluently	Fluently

## **Kaan Ozbay**

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### **1. EDUCATION**

- ❖ Ph.D., Virginia Tech University, 1996.
- ❖ M.S., Virginia Tech University, 1991.
- ❖ B.S., Bogazici University, 1988.

**Major areas of interest:** Advanced technology applications in Intelligent Transportation Systems, incident management, and real time control techniques for traffic.

### **Honors and Awards**

- ❖ Eno Fellowship Award. Selected by the board of Regents of the Eno Center for Transportation Leadership Development as a Fellow in the 1994 Transportation Leadership Development Conference
- ❖ NSF Proposal Review Panel Member. Selected by the National Science Foundation (NSF) to the NSF proposal review panel (1994).

### **2. EXPERIENCE**

#### **Academic**

- ❖ Assistant Professor, Rutgers University, 1996 - Present

#### **Research**

- ❖ Research Associate, Virginia Tech Center for Transportation Research, 1993-1995.
- ❖ Senior Research Associate, Virginia Tech Center for Transportation Research, 1993-1996.

### **3. LIST OF SELECTED PROJECTS**

- ❖ Principal Investigator of “Technical Support for Incident Management,” Virginia Tech Center for Transportation Research, 1997-present.
- ❖ Co-Principal Investigator of “Logical and Physical Simulation of Automated Dedicated Bus Lanes,” University Transportation Research Center.
- ❖ Co-Principal Investigator of “Alternate Bus Routing System Evaluation Project,” New Jersey Highway Authority.
- ❖ Co-Principal Investigator of “Wide-Area Incident Management,” Federal Highway Administration-Virginia Department of Transportation.
- ❖ Co-Principal Investigator of “Dynamic Network Optimization,” Federal Highway Administration ITS Center for Excellence.
- ❖ Co-Principal Investigator of “Tools for Evaluation of Automated Highways,” Federal Highway Administration ITS Center for Excellence.

### **4. RECENT REFEREED PUBLICATIONS**

#### **Books**

- ❖ “Incident Management for Intelligent Transportation Systems (ITS)”, To be Published by Artech House, Massachusetts, 1997 (In Progress).

### Journal Articles and Conference Proceedings

- Ozbay K., Kachroo P. Mastbrook S. "Development of Incident Response Plans for Northern Virginia" Accepted for Publication in the Proceedings of the SPIE Conference on Automatic Vehicle and Traffic Control, Pittsburgh, September 1997.
- Ozbay K., Kachroo P. "Evaluation of Ramp Metering Algorithms" Accepted for Presentation and Publication in the proceedings of the SPIE Conference on Automatic Vehicle and Traffic Control, Pittsburgh, September 1997.
- Kachroo P., Ozbay K. "Sliding Mode Feedback Control for User Equilibrium Dynamic Traffic Routing Problem" Accepted for Presentation and Publication in the Proceedings of the IEEE Conference on Intelligent Transportation Systems, Boston, MA, November, 1997.
- Ozbay K., Hobeika A.G., Zhang Y. "Estimation of Duration of Incidents in Northern Virginia Presented at the 1997 TRB Annual Conference at Washington D.C., and under review for Publication in the Transportation Research Record, 1997.
- Ozbay K., Narayanan A., Jonnalagadda S. "*Wide-Area Incident Management Support System (WAIMSS)*." Presented at the 1996 Third Annual ITS World Conference and Published in the Conference Proceedings, Orlando, Florida.
- Kachroo P. and Özbay K., "Real Time Dynamic Traffic Routing Based on Fuzzy Feedback Control Methodology", Transportation Research Record 1556, 1996.
- Kachroo P., Ozbay K. "Modeling and Fuzzy Feedback Control for Real-Time Traffic." Presented at the 1996 TRB Annual Conference at Washington D.C.
- Kachroo P., Ozbay K., "System Dynamics and Feedback Control Formulations for Real-Time Dynamic Traffic Routing with an Application Example." Accepted for Publication in the Mathematical Computation Journal, Special Issue on ITS, 1996.
- Subramaniam S., Ozbay K., "A Hybrid Expert-GIS Architecture for Wide-Area Incident Management." ITS Quarterly, 1995, Volume 3, No. 1, pp. 48-57.
- Ozbay K., Hobeika A.G., Subramaniam S., Krishnaswamy V. "*A Heuristic Network Generator for Traffic Diversion during Non-Recurrent Congestion.*" Presented at 1994 TRB Conference, Washington D.C.
- Hobeika A.G., Sivanandan R., Ozbay K., Subramaniam S.. "*Real Time Strategies for Congested Urban Networks.*" Proceedings of Second International Conference of IVHS America, Los Angeles, U.S.A, May, 1992
- Hobeika A.G., Sivanandan R., Subramaniam S., Ozbay K., Zhang Y. "*A Real Time Diversion of Freeway Traffic: A Conceptual Approach.*" ASCE Journal of Transportation, Vol. 119, no. 4 Jul./Aug. 1993, pp.515-534.
- Hobeika A.G., Ozbay K., Subramaniam S.. "*Dynamic Network Generation for Real-Time Decision Making for Freeway Incidents.*" Presented at AATT / Pacific Rim Conference in Seattle July, 1993.

### 5. PARTICIPATION IN PROFESSIONAL ORGANIZATIONS

- ❖ Fellow, ENO Transportation Foundation. Member of: ATMS Sub-Committee, IVHS America, (Since April 1994); Intermodalism Sub-Committee, IVHS America, (Since April 1994); System Architecture Sub-Committee, IVHS America, (Since April 1994); ASCE and ITE.

## **Martin E. Robins**

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### **1. PROFESSIONAL EXPERIENCE**

- ❖ Rutgers Transportation Policy Institute Feb. 1998 - Present
- ❖ Director of the Voorhees Transportation Center, Edward J. Bloustein School of Planning and Public Policy. Conceptualizes and implements a program of policy research and public forums on transportation-related issues in the New Jersey-New York Metropolitan region.
- ❖ Transportation Consultant Feb. 1998 – Present.  
Furnishes advice and guidance on major investment transportation projects and policy issues.
- ❖ Access to the Region's Core Oct. 1994 - Feb. 1998. Project Director. Managed a \$5 million planning study and staff of six, sponsored by the Port Authority, NJ TRANSIT and the Metropolitan Transportation Authority, to examine the public transit and goods movement needs across the region, covering Midtown Manhattan, northeastern New Jersey and western Queens. The likely recommendation will be construction of a new \$3 billion passenger rail tunnel under the Hudson River between northeastern New Jersey to the Penn Station area with an extension to Grand Central Terminal.
- ❖ NJ TRANSIT Waterfront Transportation Office (Division) 1988-1994. Director (Senior Director). Managed an originally autonomous office of 15 (later integrated into NJ TRANSIT), that formulated short and long-range plans for the development of a light rail system to support economic development along New Jersey's Hudson River waterfront. Among the features of the job were close consultation with local economic development offices and waterfront developers and transportation-related support for developers in attracting companies to the waterfront sites. During this tenure, the study recommended and received planning approval for a \$1.2 billion Hudson-Bergen light rail line which then moved into the preliminary engineering/Final Environmental Impact Statement stage.
- ❖ Port Authority of New York & New Jersey 1983-1988. Director, Planning and Development Department. Supervised staff of 120 professionals, including economists, strategic planners, policy analysts, market researchers, transportation analysts, transportation and land use planners. Departmental budget was \$17 million. Participated in the devising and modifying of an Authority-wide strategic management process, with special responsibility for preparation of an annual Planning Context, identification of critical issues, review of business strategies, and encouragement of line and staff priority coordination; established regular reviews and progress reporting with operating departments; served on Management Information Services Council. Oversaw preparation of a region-wide 10-year jobs, population and labor force forecast, regional international trade overview, and report on the regional mismatch between jobs and labor force skills. Supervised Trans-Hudson Task Force and other transportation planning teams which conducted detailed market research on travel behavior and analysis of system capacity which successfully recommended (a) institution of mass transit ferry service from Hoboken to Lower Manhattan; (b) expansion of Staten Island - Central New Jersey bridge capacity;

- (c) strengthening of market research function into Authority-wide resource; (d) expansion of freight movement research to gain better understanding of companies' logistical needs and warehousing and trading patterns.
- ❖ *Special Assistant to the Chairman, Metropolitan Transportation Authority* on mobility assignment for six months in 1988, principal responsibilities were to: Assist Robert Kiley in his role as chairman of the American Public Transit Association's Transit 2000 Task Force. The purpose of the Task Force was to restate the rationale for federal support of public transit and to develop a new legislative framework for a highway - transit federal-aid program. The assignment included consultation with APTA staff on substantive and procedural project direction. Assist MTA staff in the institution of an authority-wide strategic planning process.
  - ❖ **NJ Transit** 1980-1983.  
*Deputy Executive Director.* Supervised development of strategy for negotiation of first rail collective bargaining contracts with 16 unions resulting in substantial increase in management flexibility and lower costs; headed negotiations and guided litigation leading to settlement of 5-week strike. Headed Task Force which recommended and began implementation of NJ TRANSIT'S takeover of Conrail commuter rail operations. Drafted and lobbied for commuter rail provisions in Northeast Rail Service Act of 1981, notably giving carriers right to negotiate new collective bargaining agreements. Supervised units responsible for Rail Contract Management, Engineering, Developmental Planning and Subsidized Bus Carriers Contract Management. Supervised acquisition of Transport of New Jersey, the largest private bus company in the U.S. Oversaw start-up of New Jersey Transit Corporation which included organization of planning and marketing functions and Newark-Elizabeth bus route restructuring Task Force and approval of plans for centralized rail maintenance facility
  - ❖ **New Jersey Department of Transportation** 1975 –1979 *Director, Office of Policy Analysis.* Headed Commissioner Louis J. Gambaccini's Task Force to study the bus subsidy program, which drafted the bill creating the New Jersey Transit Corporation and lobbied for its prompt enactment within six month's of the bill's introduction. Developed recommendation for exercise of federal 900-Day Option permitting State of New Jersey to purchase more than 400 miles of rail lines and more than 100 stations for \$25 million. Oversaw the analysis and implementation of complex policy issues, including successful Rail Station leasing policy
  - ❖ *Executive Assistant to the Assistant Commissioner for Public Transportation.* Directed implementation of the public transit capital program and supervised the transit analysis function Headed Task Force which drafted and lobbied for commuter rail provisions to the Railroad Revitalization and Regulatory Reform Act of 1976 which permitted State of New Jersey to purchase 400 miles of rail properties and more than 100 stations for \$25 million; - furnished New Jersey with \$35 million in emergency operating assistance over three years, and set stable compensation standards for the railroads created equitable access rights to Northeast Corridor for commuter railroads
  - ❖ **New Jersey Department of Law and Public Safety** 1974-1975. Deputy Attorney General, Section Chief, Public Transportation. Headed section counseling and representing the New Jersey Department of Transportation on public transit legal matters
  - ❖ **Office of the Prosecutor, Hudson County, NJ** 1970-1974. *Assistant Prosecutor* Headed unit investigating and prosecuting official corruption cases

- ❖ Pitney Hardin & Kipp, Esqs., Newark, N.J. 1968-1970. *Law Associate*
- ❖ New Jersey Superior Court, Chancery Division 1967-1968.  
*Judicial Clerk to Hon. Nelson Mintz*

## **2. PROFESSIONAL LICENSES**

- ❖ Admitted to practice law in the State of New Jersey and before the U.S. District Court of New Jersey, 1967
- ❖ Admitted to practice law before the Third Circuit, U.S. Court of Appeals, 1972

## **3. AWARDS**

- ❖ President 's Award for Public Transportation,
- ❖ American Association of State Highway and
- ❖ Transportation Officials (AASHTO), 1980
- ❖ Princeton University Alumni Council Award for Service, 1990

## **4. EDUCATION**

- ❖ Harvard Law School, LL.B., 1967
- ❖ Princeton University, A.B., cum laude, 1964

## **5. ACTIVITIES**

- ❖ Westfield Planning Board, 1997- 1998
- ❖ Union County Alliance: Board of Directors, 1996-present. Long Range Planning Committee, 1994-present
- ❖ Union County Economic Development Corp. Board of Directors, 1986-1988; Leadership NJ. Class of 1990
- ❖ Urban Land Institute: Special Public Sector Advisor, 1990 –1991; Member, 1992-1995
- ❖ National Transit Institute; Member, panel responsible for developing a course on the interaction of land use and public transit, 1996-1997
- ❖ American Public Transit Association; Member, Policy and Planning Committee, 1989-1997

## **Susan Kupferman**

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### **1. EDUCATION**

- ❖ Master of Arts, The State University of New York at Albany, 1981. Bachelor of Science, The State University of New York at Albany, 1979.

### **Fellowships and Awards**

- ❖ American Planning Association's National Planning Award (1996)
- ❖ The American Institute of Architects' Urban Design Award (1996)
- ❖ The Waterfront Center's Top Honor Award (1996)

### **2. EXPERIENCE**

#### **Academic**

- ❖ Co-Director, The Rudin Center for Transportation Policy and Management, Robert F. Wagner School, New York University (2001)

#### **Professional**

- ❖ Deputy Executive Director for Policy, Planning and Capital Programming, Metropolitan Transportation Authority (1998-2001)
- ❖ Director of the Department of Strategic Planning & External Affairs, New York State Thruway Authority (1992-1998)
- ❖ Assistant Secretary for Transportation, Executive Chamber, New York State Governor Mario M. Cuomo (1988-1992)
- ❖ Associate Legislative Analyst, New York State Senate Finance Committee (1982-1988)
- ❖ Research Analyst, New York State Department of Transportation (1981-1982)

### **3. LIST OF SELECTED PROJECTS**

- ❖ Transportation Planning Studies: Tappan Zee Bridge Value Pricing Feasibility Study; Corridor Plan for the economic renaissance of the 524-mile New York State Canal System; Planning for an intermodal transportation center in Syracuse, New York; Development of a public/private partnership to establish high speed ferry service; Preparation and implementation of an \$18.1 billion Metropolitan Transportation Authority Capital Plan; Major Investment Study/Draft Environmental Impact Statement for a new Second Avenue Subway in Manhattan; Alternatives Analysis/Draft Environmental Impact Statement for a subway extension from Manhattan to LaGuardia Airport; Feasibility study for rail service to JFK Airport; Alternatives Analysis for the I-287 Corridor/Tappan Zee Bridge in Rockland and Westchester Counties, New York; and Strategic business plans for the New York State Thruway Authority and the Metropolitan Transportation Authority.

- ❖ External Affairs: Headed a gubernatorial task force on traffic congestion in the Lower Hudson Valley, and a gubernatorial commission on the redevelopment of the New York State Canal System; Represented the New York State Thruway Authority before Congress, the State Legislature, and the Governor Office; Served as the New York State Thruway Authority's and the Metropolitan Transportation Authority's liaison to local officials, the business community and constituency groups; Organized and participated in media events including editorial board meetings, press announcements and large-scale charitable events; Authored and published Annual Reports.
- ❖ Transportation Policy: Formulated an unprecedented clean fuel bus policy for the Metropolitan Transportation Authority; Developed fare policy for the Metropolitan Transportation Authority; Served on the Executive Policy Committee for the \$4.3 billion East Side Access project that will connect the Long Island Rail Road to Grand Central Terminal; Formulated a diverse range of policy initiatives for the New York State Thruway Authority including the Authority's position on the reauthorization of federal transportation programs, a value pricing toll initiative for commercial vehicles utilizing the Tappan Zee Bridge, a noise abatement policy for local governments and a user fee structure for the canal system; and Prepared New York State Governor Mario M. Cuomo's annual transportation policy and legislative agenda.

## **Robert Paaswell**

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### **1. EDUCATION**

Ph.D., Civil Engineering, Rutgers University, New Jersey, 1965. M.S., Applied Mechanics, Columbia University, New York, 1961. B.S., Civil Engineering, Columbia University, 1957.

#### **Major areas of interest**

- ❖ Transportation Planning and Policy, System Analysis, Transportation Economics.

#### **Honors:**

- ❖ Award for Superior Achievement, U.S. Department of Transportation Secretary's Medal; Who's Who in the World; Who's Who in Science and Engineering; Who's Who in America; Who's Who in the Midwest; Who's Who in the East; American Men and Women of Science; Ford Foundation of Scholar, Columbia University State University of New York Faculty Summer Fellowship; among others.

### **2. EXPERIENCE (MOST RECENT)**

- ❖ Director and Chief Executive Officer of University Transportation Research Center (Region 2), and Distinguished Professor of Civil Engineering.
- ❖ Professor of Civil Engineering, University of Illinois at Chicago, and Consultant in Transportation, Transit Management, Operation and Planning, Feb. 1989-Aug. 1990
- ❖ Executive Director, Chicago Transit Authority, Chicago, Illinois. Nov. 1986-Jan. 1989
- ❖ Director, Urban Transportation Center and Professor of Civil Engineering, University of Illinois at Chicago January 1982 - November 1986
- ❖ Chairman, Department of Environmental Design and Planning, State University of New York at Buffalo, 1980 - 1982
- ❖ Director, State University of New York Center for Transportation Studies. 1978-82

### **3. LIST OF SELECTED PROJECTS**

- ❖ Development of Performance Benchmarks, 1993, NJDOT; Setting Agenda for ISTEA planning methods, 1993, NJDOT; Transit Performance Guidelines, 1993, NYSDOT; Capital Budgeting analysis, 1992-1993, NFTA; Optimal Toll Strategies, 1992, TBTA; Road Pricing Conference, 1992, Borough President Manhattan; PATH: TQM assessment, 1991-1992, PANYNJ; University Transportation Research Center, 1990 - present, USDOT.

### **4. RECENT PUBLICATIONS**

#### **Books**

"Site Impact Traffic Assessment" (edit), American Society of Civil Engineers, 1992  
"Problems of the Carless," (with W. Recker), Praeger Publisher, New York City, Dec. 1977.  
"World Book Encyclopedia", articles: Transit, Subways, Buses, Port Authority

#### **Articles**

"Making the Planning Process Customer Oriented", Proceeding Conference on Panels for Transportation Planning, California, 1992.

- "Private Provision of Specialized Transportation For a Public Aging" Proceedings 6th International Conference on Mobility and Transport for Elderly and Disabled Persons, 1992.
- "Growth of Urban Transportation: Peoples Republic of China" (with Yang, Z. and Roupail, N.), Proceedings 5th Conference on Urban Transport in Developing Countries, Sao Paolo, Brazil, 1990.
- Review of "Transportation Planning in a Changing World," Nijkamp, P. and S. Reichman, eds., Transportation Research V 24A n1, 1990.
- "Evolution of Fare Policy" (with D. Stuart), Transportation Research Record, forthcoming
- "Air Quality and the Transportation Community," Transportation Research News, 1990.
- "Urban Transportation in The Peoples Republic of China" (with Z. Yang and N. Roupail) ITE Journal, March 1987.
- "Private Subscription Buses as Part of the Public Transportation System" (with C. McKnight), Urban Resources V 4n 1, 1986.
- "Private Involvement in Transportation for The Disabled" (with C. McKnight) Proceedings 4th Conference on Mobility and Transport for The Elderly and Disabled Person, 1986.
- "Transportation Research and Its Link to Education," Transportation Research Board Special Report, 1985.
- "Utilization of Microcomputers for Special Transportation Providers," Proceedings, National Conference on Transportation for the Elderly and Handicapped, 1984.
- "Quality of Service Measures for Special Transportation Services," Proceedings, International Conference for Travel Behavior, 1985.
- "Quality of Service Indicators" (with A. Pagano and C. McKnight), Transportation Research Record, 1984.
- "Urban Models and Development Policies," Proceedings, World Conference on New Developments in Urban Planning, 1984.
- "Energy Uses in Great Lakes Region in Resources of the Great Lakes," Purdue University Press, 1983.
- "A Transportation Workshop for Minority Institution Faculty" (with L. Pignataro, N. Jasper, J. Falcocchio and R. Roess), Transportation Research Board, 1984.

## **5. PARTICIPATION IN PROFESSIONAL ORGANIZATIONS**

- ❖ Member of the Executive Committee of the Transportation Research Board (1988-1991). Fellow of the American Society of Civil Engineers. Many positions including Past President of Buffalo, New York section. Member of the Institute of Transportation Engineers.

## **Joseph Berechman**

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### **1. EDUCATION**

- ❖ Ph.D., University of Pennsylvania, (Economics, City Planning), 1973.
- ❖ MBA, Wharton School, University of Pennsylvania, (Economics, Finance), 1970.
- ❖ B.A., Hebrew University of Jerusalem, Israel (Economics), 1967.

#### **Major areas of interest**

Transportation Economics, Transportation Systems Analysis and Planning, Urban Land Use Modeling, and Policy Analysis.

### **2. EXPERIENCE**

#### **Academic (Most Recent)**

- ❖ Professor, Public Policy Program and Economics, Faculty of Social Sciences, Tel Aviv University, Israel, 1995 to present.
- ❖ Fellow, The Tinbergen Institute for Economic Research, Netherlands, 1994-1995.
- ❖ Fellow, The Netherlands Institute for Advanced Study, The Netherlands, 1991-1992.
- ❖ Visiting Scholar and Research Associate, University Transportation Research Center, The City University of New York, 1992 to present.
- ❖ Visiting Professor, Rockefeller School of Public Affairs and the Department of Economics, State University of New York at Albany, Summer 1988, 1989 and 1990.
- ❖ Associate Professor, Department of Economics and Institute of Transportation Studies, University of California at Irvine, 1980-1982.

#### **Administrative**

- ❖ Head, Transportation Management and Research Institute, Recanati School of Business Administration, Tel Aviv University, 1993-1997.

#### **Recent Research**

- ❖ UK Council for Scientific Research, "Infrastructure Investment and Urban Economic Development," 1995-1996.
- ❖ University Transportation Research Center, City University of New York, "Effect of Large Scale Transportation Projects on Labor Markets," 1991 to present.

### **3. LIST OF SELECTED PROJECTS**

- ❖ Israel Highway 6 - Consultant, 1993-1996.
- ❖ Advisor to Cross-Israel Highway LTD, "Transportation Economics and Policy Analysis," 1993 to present.
- ❖ Advisor, Netherlands Ministry of Transport, "Methodology and Measurement of Airport Quality," 1996-1997.
- ❖ Israel National Committee for the Evaluation of the Proposed Large Scale Rail Project to the Red Sea, 1986.
- ❖ Advisor, Netherlands Ministry of Transport, "Aviation Markets Liberalization in Europe," 1993-1995.

- ❖ University Transportation Research Center, City University of New York, “Estimation of Bridge and Tunnel Toll Elasticity,” 1992.
- ❖ Transportation System Group, Department of Civil Engineering, SUNY at Buffalo, “Development of a Model System for Transportation Corridor Planning,” funded by the Urban Mass Transportation Administration, 1981.
- ❖ Economic Planning Authority, Ministry of the Treasury, Israel. “Project Evaluation of the Planned Central Bus Station in Tel-Aviv,” 1979.

#### **4. RECENT PUBLICATIONS**

##### **Books:**

- Transport and Land Use*, (with H. Kohno, K. Button and P. Nijkamp, eds.), Edward Elgar Publishing Ltd., 1996.
- Public Transit Economics and Deregulation Policy*, North-Holland, 1993.
- Transportation in Unified Europe: Policies and Challenges*, (with D. Banister), North-Holland, 1993.

##### **Articles:**

- "Transport infrastructure investment and economic development: a review of key analytical and empirical issues" in D. Banister (ed.), *Transport and Urban Development*, 1995, Aldershot, London
- "Urban and regional economic impacts of transportation investment: a critical assessment and proposed methodology," *Transportation Research A*, 1994, 28A(4), 351-362.
- "Bridge and tunnel toll elasticities in New York: some recent evidence," *Transportation*, 22(22), 97-113, 1995 (with Hirschman, McKnight, Pucher and Paaswell).
- "The implications of travel profiles for transportation investment: The Bronx Center Project," *Transportation*, 1997, 24(1) (with R. Paaswell).
- "Access to facilities in a competitive transport market: the North European experience." *Transportation Planning and Technology*, 17(4), 341-348, 1993 (with D. Bannister, B. Andersen and S. Barrett).
- "A note on factor pricing on highway investment," *Journal of Transport Economics and Policy*, 1991, 25(2), 177-181 (with D. Pines).
- "Demand conditions, regulation and the measurement of factor productivity," *Journal of Econometrics*, 47(2/3), 379-400, 1991 (with E. Appelbaum).
- "Modeling land use and transportation: an interpretative review of growth areas," *Environment and Planning A*, 20(10), 1285-1310 (with K. Small).
- "Highway capacity utilization and investment in transportation corridors," *Environment and Planning A*, 16, 1475-1488, 1984.
- "Rail rapid transit investment and CBD revitalization: methodology and results," *Urban Studies*, 20(4), 471-486, 1983. (with R. Paaswell).

#### **5. PARTICIPATION IN PROFESSIONAL ORGANIZATIONS (MOST RECENT)**

- ❖ Associate Editor, *Journal of Transportation Research A*, (1993-present)
- ❖ Editorial Advisory Board, *Journal of Transportation Research*, 1990-1992.
- ❖ Member of: International Regional Science Foundation, American Economic Association and the European Network on Transportation, Communication and Mobility Research.

**APPENDIX I: BUDGET I (ASSUMING THAT COSTS WILL BE PAID IN  
FULL BY THIS PROJECT)**

**APPENDIX II: BUDGET I (ASSUMING THAT SOME COMMON COSTS  
WILL BE SHARED WITH THE MONITORING STUDY OF THE VALUE  
PRICING INITIATIVE AT THE PORT AUTHORITY OF NEW YORK AND  
NEW JERSEY)**

**APPENDIX III: QUOTE FROM EAGLETON INSTITUTE USED FOR  
BUDGET PURPOSES**

**APPENDIX IV: LETTER OF COLLABORATION FROM NEW JERSEY  
TURNPIKE AUTHORITY**